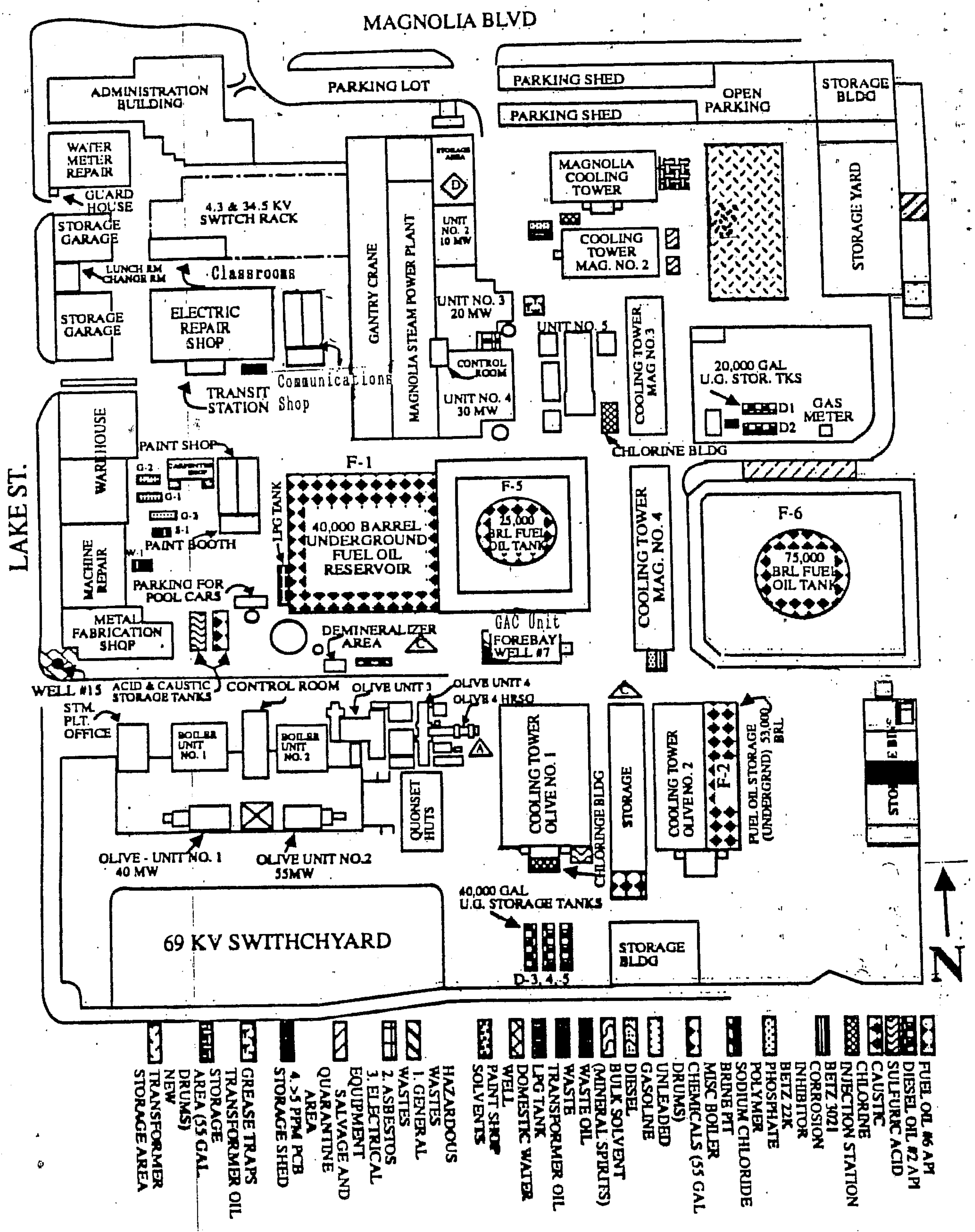

City of Burbank Power Generating Station facility diagram.

MAP 1

Technical Area: Water Resources

BACKGROUND

New Data Request based on information supplied at the Workshop.

New Data Request 1: In prior AFC and DR information it appeared that Outfall 002 would not be used for benefit of the MMP. At the Workshop slides were presented wherein Outfall 002 was now included in the MMP plan. Please confirm that it will be used, and if so what situation/logic will cause it to be used. If it will be used then provide similar approvals of the LARWQCB as is required for outfall 001.

Response: The simplified process flow diagram in Attachment 1B to Section 5.5 illustrates how the operation of Outfall 002 occurs at the COB reclaim plant. Outfall 002 serves as the overflow of reclaimed water to the Burbank Western Channel, after the priority uses for reclaimed water have been met. Priority uses of reclaimed water, as stated by COB, are first, irrigation use, and second, power plant use. Excess reclaimed water, after these priorities have been met, overflows through Outfall 002 to the Burbank Western Channel. As such, the current NPDES permit covers both Outfalls 001 and 002 as a hybrid permit covering both the power plant and POTW discharge.

The MPP will draw reclaimed water from the COB Reclamation Plant discharge line flowing to Outfall 001. Although the power plant does not use Outfall 002 water directly, the net effect of MPP will be to reduce the combined flow from Outfall 001 and 002 by the amount of water consumed by evaporative cooling in the MPP process. The net effect of this consumption is a reduction in flow to Outfall 001 and 002 by the amount tabulated in Table 3.4-1A.

Technical Area: Water Resources

BACKGROUND

Use of NOS to reduce fresh non-reclaim water demand.

Data Request 68 Rev: In the applicant's response to the DR, revised operating costs are presented for the alternative of discharging cooling tower blowdown to the North Outfall Sewer (NOS). It appears possible to eliminate the need to blend MPP cooling tower blowdown discharge with the effluent from the COB Reclaim Water Plant. Doing so could eliminate the need to supplement reclaim water with non-reclaim during those periods (7% of the time) when reclaim is not available. Please evaluate this option considering the new lower cost of service for the NOS, and the reduced hours of necessity.

Response: The option of sending cooling tower blowdown to the NOS has been evaluated and is presented as an alternate water balance in Figure 3.11-4. The need for blending the MPP cooling tower blowdown with effluent from the COB Reclamation Plant would not be eliminated by directing the blowdown to the North Outlet Sewer, because the TDS limit for that wastewater disposal pipeline is still 1200 mg/l. This would provide some relief because ability to discharge wastewater with higher TDS would reduce the MPP demand on water supplies. However, as discussed in Section 3.11.7.2 Cooling Tower Discharge Alternatives, this alternative is not the first choice. There is a significant economic penalty associated with discharge to the NOS. Even with the new lower cost of service and reduced hours of necessity, the cost of discharge would still be about a million dollars more than the cost for discharge to the Burbank Western Channel.

There are also potential environmental impacts associated with transferring the wastewater to the Hyperion plant. Discussion of environmental consequences related to sewer discharge is presented in Section 2.1.1 of Appendix R.

Technical Area: Water Resources

BACKGROUND

Effect of Power Plant on POTW

Data Request 82 Rev: The DR is still not answered. Applicant still claims nothing more than not exceeding permit constraints on the outfalls. The Data Request is to provide the expectations of what will occur rather than what will not occur. Specifically address TDS, but also temperature and chemical species of interest. Recognizing that continuous variation in reclaim water chemical concentrations occur, the prediction needs to include some means of addressing this variation. A means might be to use the graph presented in the Year 2000 Annual NPDES monitoring report, adding the post MPP expectations thereto. Response to DR 96 and 105 among others make it appear that MPP intends to operate at 949 mg/l TDS normally. If this is the operating plan, please so state. If not, please explain what the plan will be. It is necessary to know the "before and after" impact of the project on the outfalls.

Response: Revised section 3.4.7.5 addresses this Data Request in detail. In summary, the outfall TDS will be lower than the limit of 950 mg/L more than 70% of the time (Table 3.4-5). The average outfall TDS will be 816 mg/L. All other chemical species will be below their respective discharge limits unless the reclaimed water from the RWP already exceeds the limit. If the RWP determines that the reclaimed water is unsuitable for discharge, it will divert it to the North Outfall Sewer and the MPP will utilize non-reclaimed water for the duration of the upset.

Since the cooling tower blowdown will be taken from the cooling tower basin at a maximum temperature of 84 ^{o}F, the discharge limit of 100 ^{o}F will not be exceeded.

The conductivity of the discharge to Outfall 001 will be continuously monitored and the plant operated to avoid exceeding the TDS discharge limit.

Technical Area: Water Resources

BACKGROUND

Future COB wastewater plant improvements.

Data Request 86 Rev: It is now clear that the statement in the revised AFC regarding "revisiting" of wastewater volumes are irrelevant to this AFC. However, the last sentence of Revised AFC Section 5.5.2.1.1.says "The discharge quality shown in Table 5.5-1 shows the effect of reducing heavy metals at the reclaim water plant". Is revised Table 5.5-1 relevant to the current AFC or irrelevant?

Response: Table 5.5-1 is still relevant to the AFC. As discussed in Section 5.5 of the AFC, the COB is pursuing a retrofit to the reclaim water plant that may significantly improve the reclaim water quality and quantity. When the retrofit is completed, the volume of reclaim water will likely increase and the frequency of plant upsets may be reduced. This retrofit, which is unrelated to the MPP, would likely reduce MPP's reliance on non-reclaimed water sources. The discharge quality shown in Table 5.5-1 takes into account the effects of this retrofit in terms of reducing the level of nitrogen and heavy metals at the COB Reclamation Plant.

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Technical Area: Water Resources

BACKGROUND

Impact of plant on POTW

Data Request 87 Rev: The response is that the total solids load to the receiving water is unchanged, although the chemical concentration is increased due to evaporation of water at the power plant. The applicant has not said that the higher dissolved solids concentration has no impact on the receiving water, only that the numbers are small. Review of Table 3.4-4 shows that the results are NOT small, and in fact the TDS as well as other species of chemical is substantially affected by the MPP. In any case, the answer does not say what the impact is at the Outfall 001, which is the question. This may be resolved by answer to DR 82.

Response: In the worst case, the concentration of the dissolved solids in the discharged water will increase by 30% due to the evaporation of water by the MPP. However, as described in the revised section 3.4.7.5, this situation is expected to exist less than 30% of the time. On the average, the concentration will be 86% of the discharge limit.

The impact of the discharge on receiving waters is addressed in Section 5.5.

Technical Area: Water Resources

BACKGROUND

Limitation of potable water consumption

Data Request 91 Rev: There is still no identification of the derivation of the numbers in Table 3.4-1A of the revised Section 3. Examples: Is water injection to the combustion turbine included in the numbers? Workshop response indicated that the use of water injection would be limited to 200 hours per year – please confirm. What plant capacity factor was used in the derivation? How many hours of operation? Why is there not more superfund ground water withdrawn? Do the annual numbers include any particular reliability of the reclaim facility? Also see DR 93 below.

Response: The assumptions underlying Table 3.4-1A and the Water Balance diagrams, Figures 3.4-5A through 3.4-5D are given in the revised section 3.4.7.4.1. The reliability of the RWP is addressed in section 3.4.7.3.

Table 3.4-1A indicates the amount of non-reclaimed water expected to be required for typical operations of the MPP. As discussed in Section 3.4.7.1.2 the primary source of back-up water to be used during upset conditions is the local groundwater. This water will be provided by the COB in accordance with a facility services agreement.

Technical Area: Water Resources

BACKGROUND

Reclaim water rationing.

Data Request 93 Rev: The number of 16% was apparently changed to 7% in the Workshop. Please confirm, and include at proper places in the AFC. Is this number used in derivation of Table 3.4-1A (see DR 91 comment)? Since the 16% outage time was reduced to 7%, why has the annual potable water consumption remained unchanged at 275 AFY?

Response: The amount of non-reclaim water is discussed in revised Section 3.4.7 and Table 3.4-1A has been updated accordingly. This revision was based on an a review of the historical operations at the COB RWP. Based on this historical review and MPP's projected operations, the MPP estimates it will use approximately 434 acre-feet per year (afy) of non-reclaim water for cooling purposes in an average year. This amounts to 8.5% of the total water supplied to the MPP. Had the MPP been in operation during the past four years, the required amount of non-reclaimed water would have varied between 1.3% and 18% per year.

In addition to the upset conditions, the MPP will also need non-reclaimed water to be used in the demineralizer to produce steam cycle makeup demineralized water. Although this will only be needed when the reclaimed water quality is insufficient and may damage the demineralizer equipment, MPP has conservatively estimated using non-reclaimed water for makeup 100 percent of the time. It is expected that the MPP will need an average of 49 kgpd, or 65 gpm, of demineralized water over the course of a typical year. This amounts to 105 acre-ft/year (afy) or about 2% of the total water supplied to the MPP.

Technical Area: Water Resources

BACKGROUND

Reclaim water constraints

Data Request 94 Rev: Revised AFC says "The availability of reclaimed water is constrained by…" Apparently the 2 million gallons of irrigation water storage is not new. Therefore, it is still not clear what is the cause of the "constrained by" elements; how much due to diurnal cycles, how much due to seasonality, and how much due to reclaim plant reliability. The 16% constraints, now 7%, if due to seasonal influences can be changed only with major storage, but if due mostly to reclaim plant reliability then might change with aging of the plant or future improvements in the plant. For these reasons it is still desirable to know specifically what is the cause of the limited availability of the reclaim water.

Response: Table 3.4-2 in the revised section 3.4.7.3.1 summarizes the monthly variation of the availability of reclaimed water over the past four years. The monthly averages reveal a seasonal component to the RWP output with the springtime flow about 20% above average and winter flow about 20% below average.

The annual variation is also about ±20%. This implies that most of the non-reclaimed water requirement is not due to short term upsets but rather to environmental and seasonal variations in wastewater flow to the RWP.

A review of historical data for the RWP shows that there is a strong diurnal variation in flow. In order to accommodate this variation, a 2.2 million gallon reservoir for reclaimed water storage and a 180,000-gallon storage tank to store cooling tower blowdown will provide ample time for the plant to average the plant makeup flow.

Technical Area: Water Resources

BACKGROUND

Cycles of Concentration

Data Request 96 Rev: The reason for a maximum 5.6 cycles in provided. However, there is no indication that very low cycles might not be used, requiring greater makeup than indicated in the AFC. Secondly, this is the first and only mention of the control of the MPP operations on the discharge of Outfall Number 001; this appears inconsistent with the answer above that the amount from the plant is too small to affect the outfall. Further clarification is needed. Response to DR82 may clarify this data request as well.

Response: The water management and operational philosophy is presented in section 3.4.7.1 of the revised section 3.4.7. As explained in this section, the cooling tower cycles of concentration do not affect either water consumption or discharge quality.

The controls that affect the cooling tower operations are given in section 3.4.7.6.1.

Technical Area: Water Resources

BACKGROUND

Approval of LARWQCB

Data Request 98 Rev: The letter supplied in response to this DR indicates that no change is expected in the "discharge characteristics, including the temperature, as a result of the Magnolia Power Plant modernization." (3rd paragraph LARWQCB letter of August 30, 2001 to Mr. Carnahan of SCPPA). Please confirm that this includes the substantial increase in concentration of the chemicals in the discharge and whatever change in temperature would be caused by the addition of the cooling tower blowdown at expected temperatures.

Response: This data request is addressed in the response to DR 82.

Technical Area: Water Resources

BACKGROUND

Demineralizer source

Data Request 99 Rev: Water balance diagrams (Revised Figure 3.4-5 A thru D) do not agree with the changed information presented at the Workshop, both in terms of flow rates and storage tanks. Correction needed as these documents will probably be used for other purposes, potentially even design of the plant. The prior response submitted was interesting but not relevant to the data request.

Response: New water mass balances have been provided in the revised Section 3.4.7 to conform to the revised plan for using reclaim water including the storage of both reclaim and cooling tower blowdown.

Technical Area: Water Resources

BACKGROUND

Table 5.5

Data Request 100 Rev: The AFC needs to be correct for this section in order for the references (multiple) to be correct. Please correct the AFC to match the response given.

Response: Section 5.5 has been revised accordingly and is submitted with these responses.

Technical Area: Water Resources

BACKGROUND

Derivation of Water Requirements.

Data Request 104 Rev: A substantial amount of data was provided in the response, but not the data used to generate the calculation of annual water requirements. The "load factor" assumption of "100% determined by the load demands of the cities" is not a numeric assumption. Some number had to be used to achieve the annual demand numbers used in the AFC. Later in this DR is the statement "discussion of the load factor is not discussed because this would be a design issue from Black & Veatch". In fact, some assumptions of some sort must have been made to derive the numbers given in the AFC. Additionally, there is no stated assumption of whether water injection is assumed, assumed off, assumed 24 hours, or other, and this is a substantial consumer. Next, no assumption of weather is given (i.e.; is this a hot year, a maximum cold day times 365, or other). Reclaim water flow for 2000 is provided; was this the amount used to derive the consumption number used in the AFC? Alternate A and B are shown, but there is no Alternates in the AFC, so it is not clear what these refer to.

Response: The assumptions for the derivation of the numbers presented in Table 3.4-1 and the water mass balances are presented in the revised section 3.4.7.4.1

Alternates A and B are presented in the Alternatives section of the DAR. These include a discharge to the North Outlet Sewer and the costs associated with using a landfill for the disposal of solids waste generated by any plan to treat cooling tower blowdown.

Technical Area: Water Resources

BACKGROUND

Blowdown number variations.

Data Request 105 Rev: The explanation of the numbers is fine, but the statement "The real resolution is that the cooling tower will be operated at cycles lower that the 5.6 because the higher cycles of concentration are judged as detrimental to the operation of the plant equipment" is discouraging, since this is the specific question asked above for which no answer is given. If the number 5.6 is maximum, what is minimum? Concern exists since the minimum, not the maximum, determines the amount of water that will be consumed. What assumption is used for the average water flow in the request above? This needs consistent explanation.

Response: Section 3.4.7.1 of the revised section 3.4.7 explains the operational philosophy for the MPP. Cooling tower cycles of concentration do not affect the amount of water that will be consumed. The water supply requirements are addressed in revised section 3.4.7.2.

Technical Area: Water Resources

BACKGROUND

Drawing error

Data Request 107 Rev: The further explanation is appreciated, but the diagram should be corrected in order to assure that the plant is built in accordance with the final CEC authorization.

Response: Data Request 5 includes a revised Drawing 099523-DS-S3002.

Technical Area: Water Resources

BACKGROUND

Chemical Limits

Data Request 108 Rev: The further explanations are appreciated. However the phrase "Variations in the cooling tower cycles of concentration and the rate at which the blowdown is discharged will be made to achieve the required quality at Discharge 001" is exact description of the logic that was not given before; another way of saying this is that the MPP will control operations so that the Discharge 001 operates right up to the limits permitted by the RWQCB. If this is the logic to be used, please so indicate.

Response: Revised section 3.4.7.5 addresses the issue of discharge quality. Based on historical data, the discharge quality will be below the discharge limits more than 70% of the time.

Technical Area: Water Resources

BACKGROUND

Table 3.4-5

Data Request 109 Rev: The corrections are appreciated, but term "Typical Wash Volume" is still foreign. The table and the text it supports do not support each other, and do not seem to be on the same exact subject.

Response: Please refer to Section 3.4.7 for Table 3.4-5.

Technical Area: Water Resources

BACKGROUND

Outfall flow data

Data Request 111 Rev: The diagrams should be corrected to reflect your response.

Response: New water mass balances are attached to the response for Data Request 99. Please refer to Data Request 99.

Technical Area: Water Resources

BACKGROUND

Water injection

Data Request 112 Rev: The question is for flows presented BEFORE table 3.4-5. The response is for numbers IN table 3.4-5. The question remains, is the injection included in the many flow values used throughout the AFC? And specifically how much injection in terms of hours or volume of water.

Response: The water required for steam injection is included in the tables and water balances throughout the AFC. The use of steam injection will be limited to 200 hours per year.

3.4.7 Water Supply and Treatment

The MPP will use a combination of sources for the water supply. The primary source will be reclaimed water delivered to the site from the nearby COB Reclamation Plant. MPP will maximize use of the reclaimed water to limit reliance on non-reclaimed water sources. Non-reclaimed water sources include potable and non-potable sources delivered to the site by COB. The MPP will use reclaimed water for power plant cooling and for demineralized water when its quality will not damage the demineralizing equipment. However, as described below, there will be times when the MPP will either have to supplement its water supply with non-reclaimed sources supplied by the COB or will have to rely solely on non-reclaimed sources. In general, these conditions will be limited to those periods when the COB Reclamation Plant is experiencing upset conditions for periods longer than 8 hours or when the quality of the reclaimed water prevents its use as makeup water for the demineralizer.

3.4.7.1 Water Management and Operational Philosophy

The MPP has been designed to maximize the use of all available reclaimed water from the COB Reclamation Plant and to minimize the use of non-reclaimed water sources. To accomplish this goal, the MPP will manage the use of reclaim water during times of variations in volume and in water quality characteristics.

During normal operations, the MPP will draw a portion of the existing COB reclaim water discharge to Outfall 001 and 002 and divert it for power plant needs. The reclaimed water will be used for circulating water in the cooling towers and, when its quality is sufficient, for make-up water for the demineralizing equipment. Cooling tower blowdown will be delivered to the existing COB discharge line to Outfall 001 and managed to prevent the COB discharge from exceeding its NPDES discharge limitations. (See Section 5.5 for a more detailed description of this process.) During periods of low reclaimed water availability, the use of the Cooling Tower Blowdown Tank will enable the MPP to retain the blowdown stream until such time that return of the blowdown will not cause the COB to exceed its NPDES discharge limitations.

In order to manage the diurnal fluctuations in the available volume of reclaimed water, MPP will incorporate an influent reclaimed water storage tank. MPP will use an existing 2.2 million gallon tank that is currently located underground beneath the Olive 2 cooling tower. This tank was used by the COB to store fuel oil and has been drained, cleaned, and decommissioned. The MPP will line this tank to make it suitable for reclaimed water storage. During times of peak reclaimed water flows, the tank will be filled in order to create a reserve for times of reduced reclaimed water flow. The tank will allow the MPP to operate at peak load for a period of up to 8 hours without delivery of any reclaimed water from the

Reclamation Plant. The incorporation of this tank will eliminate the daily reliance on supplemental non-reclaim water sources for power plant cooling during diurnal variations.

3.4.7.1.1 TDS Control and Water Chemistry. The TDS of the water discharged at Outfall 001 is determined by four factors:

1) The quantity of reclaimed water discharged from the COB RWP toward Outfall 001;

2) The TDS of the reclaimed water discharged from the COB RWP toward Outfall 001;

3) The amount of water evaporated by the MPP evaporative cooler and cooling tower and steam injected into the turbine; and

4) The amount of chemicals added or removed as a result of treating the circulating cooling tower.

The TDS in not directly affected by the cooling tower cycles of concentration. If the TDS or any other characteristic of the Outfall 001 discharge approaches a limit imposed by the NPDES Permit, an alternate source of makeup water will be required to augment the reclaimed water. The quantity of additional water required will be determined by the cause or combination of causes responsible for the approach to the limit.

Based on historical data, it is expected that the quantity of augmentation water required will be 1.5-18.0% of the total annual plant makeup.

3.4.7.1.2 Upset Condition and Other Water Sources. The COB has agreed to supply city water as a backup water source for those periods when reclaimed water is unavailable due to Reclamation Plant upset conditions. A copy of the will serve letter is contained in Appendix "V" entitled COB Will Serve Letters. In addition, the MPP may require city water for make-up for demineralized water when the reclaim water is of such poor quality that it will damage the demineralizing equipment. This back-up water will be provided from the existing water system and will include local well water (the primary source of supplemental water for the MPP) and other domestic water supplied via the Metropolitan Water District (MWD) and State Water Project (SWP) (the secondary emergency backup source of supplemental water for the MPP). Well water will be treated, as needed, to remove VOCs prior to use for the MPP cooling water requirements.

The need for non-reclaim water to supply the demineralized water system will be infrequent and will constitute an upset condition.

Domestic water will also be used in the fire protection system and potable water system. The potable water use for plant personnel and service water is 2,000 gpd. The domestic water supply for the COB is provided by three sources: groundwater (61%), Colorado River (4%) and SWP (35%). Reclaimed water for irrigation makes up four percent of the COB supply. Sanitary wastes will be discharged to the sanitary sewer via existing on-site connections.

3.4.7.2 Water Supply Requirements

The typical daily and maximum daily water supply requirements for the MPP are shown in Table 3.4-1, and Table 3.4-1A shows the expected annual water consumption. Figure 3.4-5A shows the expected annual average daily water supply requirements for an average day, and Figure 3.4-5B shows the water supply requirements for a maximum daily condition. Figure 3.4-5C shows the expected annual average daily water supply requirements with a 50% blend of well water with reclaim water, and Figure 3.4-5D shows the maximum day water supply requirements for the same situation.

TABLE 3.4-1

MPP DAILY WATER SUPPLY REQUIREMENTS

	Average Usage[1]	Maximum Usage[1]
Water Supply – Reclaim Water Only		
Cooling Water Makeup	1,348,000 gal/day[2]	1,854,000 gal/day[2]
Cycle Makeup Treatment System	94,000 gal/day	229,000 gal/day
Plant and Equipment Drains	11,000 gal/day	11,000 gal/day
Evaporative Cooler	35,000 gal/day	89,000 gal/day
Chemical Drains	0 gal/day	0 gal/day
Bypassed to Discharge[3]	3,067,000 gal/day	4,363,000 gal/day
TOTAL[4]	4,555,000 gal/day	6,546,000 gal/day
Domestic Water Potable and Sanitary Uses[5]	2,000 gal/day	2,000 gal/day

1 "Average Usage" is based on a 64º F (average annual) ambient temperature, and "Maximum Usage" is based on 81º F ambient temperature (daily average) at full load with duct firing 12 hrs/day.

2 Does not include wastewater streams recycled to tower as supplemental makeup. Refer to water mass balance (Figures 3.4-5A through D) for amounts of wastewater to be recycled to the cooling tower.

3 The flows shown will vary depending on reclaimed water quality. On days when sufficient reclaim water is not available, other waters are used to supplement the reclaimed water supply.

4 Plant drains are not combined with other reclaim use on the water balances.

5 Potable water is the emergency cooling water supply.

Water supplied will be used for makeup to the cooling tower and CTG inlet air evaporative cooler, domestic uses, fire water, cycle makeup, and miscellaneous plant uses. The cooling tower duty includes auxiliary cooling loads.

TABLE 3.4-1A

MPP ANNUAL WATER CONSUMPTION REQUIREMENTS

Water Supply	Average Annual Usage[1]
Reclaimed Water to MPP[2]	4,668 acre-ft/year
Non-Reclaimed Water[3]	434 acre-ft/year
Non-Reclaimed Water for Demin. Syst.[4]	105 acre-ft/year
Water from MPP to Discharge	3,740 acre-ft/year
Net Water Consumed	1,362 acre-ft/year
Domestic Water	2.2 acre-ft/year
Total Water Use	1,364 acre-ft/year

[1] Based on 64º F annual average temperature and full load operation.

[2] Based on 732 mg/l TDS.

[3] Based on historical reclaimed water availability.

[4] Non-reclaimed water for non-cooling use.

3.4.7.3 Availability of Reclaimed Water

An analysis of the COB Reclamation Plant historical operations was performed to determine the temporal variation in the quantity and quality of available reclaimed water. For purposes of this analysis, the total flow to Outfalls 001 and 002 was considered available to the MPP.

3.4.7.3.1 Available Volume. The volume of available reclaimed water is directly related to COB Reclamation Plant operations. Based on an analysis of the available reclaimed water produced by the COB Reclamation Plant, it has been determined that the Reclamation Plant discharges an average of 5.0 MGD to the Burbank Western Channel. Historical reclaimed water flow data was used to assess the availability of reclaimed water to meet the water requirements of the MPP and to estimate the annual consumption of non-reclaimed water by the MPP. MPP has used this average daily estimate in its design and water balance calculations to maximize the use of reclaimed water over other non-reclaim water sources.

MPP obtained hourly, daily and monthly historical data from the COB Reclamation Plant relating to volumes of waste delivered to the Reclamation Plant (input), volumes of waste diverted to the North Outfall Sewer (bypass) and the volumes of reclaimed water produced after treatment of the incoming waste streams (output). The historic reclaimed water availability is summarized in Table 3.4-2, below, and data showing average daily discharge flow is attached as Appendix “T” entitled Reclaimed Water Availability.

TABLE 3.4-2

HISTORIC RECLAIMED WATER AVAILABILITY, MGD

	1998	1999	2000	2001	Average
January	4.902	4.866	2.953	5.677	4.600
February	7.003	4.990	3.240	7.073	5.577
March	6.417	5.342	2.626	7.160	5.386
April	6.487	6.275	2.857	6.689	5.577
May	6.912	4.957	5.810	5.639	5.830
June	5.479	3.001	6.710		5.063
July	5.027	4.236	5.368		4.877
August	5.425	3.932	5.898		5.085
September	5.695	2.509	5.625		4.610
October	5.043	3.679	6.033		4.918
November	4.819	3.760	5.667		4.749
December	4.905	2.556	4.544		4.002
Average	5.666	4.172	4.785	6.433	5.064

In general, the data indicates that the COB Reclamation Plant has demonstrated reliable operation at capacities sufficient to meet the needs of MPP plus other existing irrigation uses. The COB Reclamation Plant processes wastewater in sufficient quantities to be considered a reliable water supply source for nearly all of the MPP water requirements.

However, the COB Reclamation Plant experiences seasonal and daily diurnal variations related to the fluctuations in the volume of incoming waste, and the COB Reclamation Plant experiences “upset” conditions during which the plant either ceases to operate or produces reclaimed water of a quality unusable by the MPP.

The data shows numerous periods of lower flow rates. The lower flow rates are typically related to equipment failures or microbiological upsets. Lowering flow at the Reclamation Plant is a necessary way of balancing the microbial activity to treat excessive organic matter. Increased residence time is beneficial in reducing carryover of waste matter or extra microbial growth into the effluent. The data indicates that the Reclamation Plant experiences these type of upsets roughly two weeks out of the year or about 5 percent of the time (on an annual average basis).

Other users of reclaimed water include the COB Public Works Department that uses reclaimed water for irrigation purposes. The largest irrigation use is for the De Bell golf course located approximately 2 miles northeast of the MPP site. The COB Public Works Department maintains an existing 2 million gallon reclaim water storage reservoir to manage golf course irrigation. It is important to note that the golf course is irrigated in the early hours when power demands are expected to be low, and therefore, minor variations in the volume of reclaimed water used for irrigation and use of the reservoir will have nominal impact on the volume of reclaimed water available after the COB Public Works Department's irrigation needs are met. See Section 5.5.2.1.1 for a more detailed discussion of the other uses of reclaimed water from the COB Reclamation Plant.

3.4.7.3.2 <u>Available Water Quality</u>. The Reclamation Plant utilizes an industry standard biological treatment system that produces reclaimed water from the gray water without causing pollution of any surrounding water system. The influent that cannot be treated by the Reclamation Plant due to quality or volume in excess of Reclamation Plant capacity, is discharged to the North Outfall Sewer (NOS) for treatment by the City of Los Angeles Hyperion Treatment Plant. All of the reclaimed water produced by the COB Reclamation Plant that is not diverted for use by the COB for power plant cooling or irrigation is discharged to the Burbank Western Channel through Outfall Nos. 001 and 002 in accordance with an existing NPDES permit held by the COB. Appendix I contained in the original MPP AFC contains a copy of the COB NPDES permit. See Section 5.5 for a complete discussion of the NPDES permit and its relation to the MPP.

Data obtained from the COB Reclamation Plant concerning the variation in quality of the reclaimed water was analyzed and is summarized in Appendix "U" entitled Reclaim Water TDS Measurements and the 2000 Annual NPDES Report. A summary of the expected water quality is presented in Table 3.4-3. The data indicates that the total dissolved solids (TDS) concentrations in the reclaimed water varied from 434 to 867 mg/l for the period from 1996 to 2001. The COB NPDES Permit establishes a discharge limitation of 950 mg/l for TDS at either Outfall 001 or Outfall 002.

TABLE 3.4-3

RECLAIMED WATER QUALITY, mg/l

	1996	1997	1998	1999	2000	2001	Average
January	661	740	600	601	739	554	649
February	701	608	434	583	565	558	575
March	736	847	543	662	653	601	674
April	754	657	493	536	586	530	593
May	756	626	519	574	717	577	628
June	743	785	538	549	722	606	657
July	867	759	568	653	476	641	661
August	781	749	517	675	622	607	659
September	681	604	662	585	741		655
October	697	659	605	546	676		637
November	651	520	582	685	558		599
December	540	547	536	620	552		559
Average	714	675	550	606	634	584	627

When reclaimed water is temporarily unavailable due to an upset at the Reclamation Plant, the MPP will use water stored on-site for makeup to the cooling water system. Any blowdown produced during these conditions would be stored in the blowdown storage tank. The reclaimed water storage tank will provide makeup water needs for MPP for about 8 hours (at full plant load on the maximum temperature day). The blowdown tank will be sized to accumulate another 8 hours s of normal blowdown at the 5.6 cycles of concentration, On average, these tanks will provide MPP capacity to handle upsets of about a day in duration without relying on a backup non-reclaim water source. Upsets of such duration occur infrequently, only a few times per year.

3.4.7.4 <u>Water Quality and Balance</u>

The COB reclaimed water, well water, and domestic water supplies have average water qualities as listed in Table 3.4-4. Annual average water use is shown in the water balance diagrams, Figures 3.4-5A and 3.4-5C. Maximum daily water use is shown in the water mass balance diagrams, Figure 3.4-5B and 3.4-5D.

3.4.7.4.1 <u>Water Balance Assumptions</u>. The following parameters were used to generate the water balance figures 3.4-5 A through D from which all tabular data are derived:

1) The HRSG steaming rate is 437,718 pounds per hour.

2) The load factor used is 100 percent.

3) Duct firing is considered 1000 hours per year for the average cases and 12 hours per day for the maximum cases. Corresponding steam injection is based on 123,150 pounds per hour water use. This is a conservative estimate since the MPP has committed to a limit on steam injection of 200 hours per year.

4) HRSG blowdown is set to 1.83 percent of the steaming rate. Derived from experience.

5) All steam injection water, blowdown and non-recoverable losses are equal to the steam cycle makeup.

6) Gas turbine washing and HRSG soot blowing and other non-cycle, demineralized uses are equal to 71,000 gallons per day for the units under consideration. Derived from experience.

7) The dry bulb temperature for the annual average case is 64^{o} F and the relative humidity is 50 percent.

8) The dry bulb temperature for the maximum daily case is 81^{o} F and the relative humidity is 26 percent.

9) Drift from the cooling tower is mandated to be 0.006 percent.

10) Cooling tower circulation rate is 51,319,888 pounds per hour.

11) Evaporative coolers are used in the cycle. The cycles of concentration used in the evaporative coolers is 1.5 due to the high susceptibility of the small tubes in the cooler to scaling type fouling.

12) Evaporative cooler evaporation is equal to 4,000 pounds per hour on an average day and 10,500 pounds per hour on a maximum day.

13) The average cooling tower evaporation is 397,796 pounds per hour.

14) The maximum cooling tower evaporation is 522,350 pounds per hour.

15) Plant service water uses are estimated at 7.6 gpm from experience.

16) An average of 100 gallons per day of precipitation anticipated to be processed through the oil/water separator at MPP.

17) The worst case described, when using non-reclaim water, is a 50/50 blend selected to produce a mid-point between the 100 and 0 percent reclaim water use cases.

18) For the design reclaim water quality (732 mg/l), the cycles of concentration are 5.6 based on the silica limit (150 mg/l).

TABLE 3.4-4

EXPECTED RECLAIMED AND DOMESTIC WATER QUALITY (mg/L, EXCEPT AS NOTED)

Constituent	Design Reclaimed Water	Design Well Water	Design Domestic Water
Calcium	57	58	61
Magnesium	18	14	15
Sodium	114	37	44
Potassium	15	3	3
M-Alkalinity, as $CaCO_3$	247	174	184
Chloride	82	29	34
Sulfate	96	56	62
Fluoride	<0.1	0.5	<0.1
Nitrate	25	18	21
Silica	23	5	22
TSS	1	1	0.2
Turbidity	1	NR	0.4 (NTU)
TDS	732	434	479
BOD_5	8	NR	NR[1]
Ammonia	NR[1]	NR	NR[1]
COD	NR[1]	NR	NR[1]
Boron	<1	NR	NR[1]
Phosphate	3	NR	<0.1
pH, S.U.	7.3	7.3	7.6
Cyanide	<0.02	NR	NR[1]
Cadmium	<0.010	<0.010	NR[1]
Chromium	<0.010	<0.010	<0.010
Copper	0.001	0.050	0.007
Lead	<0.050	<0.050	NR[1]
Mercury	<0.001	<0.001	NR[1]
Nickel	<0.001	0.010	NR[1]
Silver	<0.050	0.010	NR[1]
Zinc	0.001	0.050	0.21

[1] NR – Not reported.

Several basic parameters for water use calculations are obtained from the heat balance. These include the steaming rate, the steam injection rate, the air cooler evaporation rate, and the cooling tower evaporation.

The boiler (HRSG) blowdown and the steam losses are estimated as a standard percentage of steaming rate. Once these two numbers are calculated and the steam injection is accounted for, the actual demineralized makeup to the HRSG is calculated. Blowdown, steam injection and steam losses are all shown on the Figures 3.4-5 A through D.

The cooling tower evaporation is based on the heat rejected from the main steam cycle. The cooling water circulation rate is used to determine the drift rate from the cooling tower. Based on the cooling tower evaporation and the makeup water quality, the cooling tower blowdown is determined by calculation. The sum of the evaporation, blowdown and drift is equal to the cooling tower makeup rate. All values are shown on Figures 3.4-5 A through D.

3.4.7.4.2 Annual Average Temperature Cases. Figures 3.4-5A and 3.4-5C depict the annual average water balances for the MPP. They represent a composite of peak and off-peak operations. Peak operations occur from June through September for 12 hours per day for a total of 1,000 hours per year. During this time, water consumption is significantly increased by duct firing the HRSG, which increases the heat rejected in the cooling tower and thereby increases the water evaporated in the tower and by direct steam injection into the CTG. Steam injection will be limited to not more than 200 hours per year. By accounting for both peak (1,000 hours) and off-peak (7760 hours) operations, a more accurate estimate of annual consumption is obtained. The annual average temperature of 64^{o} F was obtained from the Western Region Climate Center for the Burbank Valley Pump Plant and was based on over 60 years of data.

3.4.7.4.3 Maximum Daily Cases. Figures 3.4-5B and 3.4-5D illustrate the maximum daily water balances for the MPP. They represent a composite of peak and off-peak operations during a typical summer day. Peak operations occur from 8:00 a.m. to 8:00 p.m. During this time, water consumption is significantly increased by duct firing the HRSG, which increases the heat rejected in the cooling tower and thereby increases the water evaporated in the tower and by direct steam injection into the CTG. By accounting for both peak (12 hours) and off-peak (12 hours) operations, a more accurate estimate of the maximum daily consumption is obtained. The 81^{o} F maximum day was based on a 24 hour average of a day with a 95^{o} F high and a 67^{o} F low temperature.

3.4.7.4.4 Maximum Reclaimed Water Cases. Figures 3.4-5A and 3.4-5B depict the annual average and maximum daily water balances for the normal case in which the MPP uses reclaimed water for all cooling and process requirements except for potable and sanitary systems. The annual average and maximum daily temperatures were the same as in 3.4.7.4.2 and 3.4.7.4.3 above.

3.4.7.4.5 Partial Reclaimed Water Cases. Figures 3.4-5C and 3.4-5D depict the annual average and maximum daily water balances for the occasional case in which the MPP uses reclaimed water augmented with non-reclaimed water supplied by the COB for cooling and process requirements except for potable and sanitary systems. These cases illustrate a 50:50 blend of reclaimed and non-reclaimed water. The need for this much non-reclaimed water is a rare occurrence and so this case represents an extreme design case. The annual average and maximum daily temperatures were the same as in 3.4.7.4.2 and 3.4.7.4.3 above.

3.4.7.5 Power Plant Discharge

The combined wastewater discharge from the plant to the reclaimed water discharge pipe will consist of cooling tower blowdown, oil/water separator effluent and precipitation (refer to Tables 3.4-6 and 3.4-7). Figures 3.4-5A/B/C/D also illustrate the power plant discharge scheme.

Outfall 001 will be maintained at or below the NPDES limit of 950 mg/l TDS. Based on historical data, Outfall 001 will be below the TDS limit over 70% of the time. Table 3.4-5 Estimated Outfall 001 Quality shows the Outfall 001 TDS levels that would have occurred had MPP been in operation during the period of 1998 through May, 2001. During this period, Outfall 001 TDS would have averaged 816 mg/l.

The typical chemical composition of the reclaimed water is such that if the TDS of the discharge to Outfall 001 is maintained at 950 mg/L or less, none of the chemical species will exceed the NPDES limits. Table 3.4-6 shows that, based on recent analyses of the RWP discharge, the concentration of Bis (2-ethylhexyl-) phthalate would exceed the outfall limit. However, this situation could not be avoided by design or operational changes to the MPP since the effluent from the RWP already exceeded the limit.

Based on historical data, the average temperature of the water discharged to Outfall 002 is 79^o F (the temperature at Outfall 001 was not recorded). The temperature ranged from 71^o F to 88^o F. The cooling tower blowdown will be taken from the cold water in the cooling tower basin at a maximum temperature of 80^o F under normal load and 84^o F during peak load. Peak load operations would increase the average discharge temperature by, at most, 0.3^o F. The maximum discharge temperature (88^o F) would be lowered by 0.3^o F and the minimum discharge temperature (71^o F) would be raised by 1^o F. Under normal load, the impact would be less. In no case would the discharge temperature exceed the limit of 100^o F.

In order to assure that the Outfall 001 discharge limits are not exceeded, the combined discharge will be continuously monitored for conductivity, which is directly proportional to TDS. If the TDS approaches the discharge limit, supplementary water will be supplied, first from the reclaimed water storage tank and then, if necessary, from non-reclaimed water provided by the COB.

TABLE 3.4-5

ESTIMATED OUTFALL 001 QUALITY, mg/l

	1998	1999	2000	2001	Average
January	781	784	950	702	804
February	530	766	873	675	711
March	685	829	941	720	794
April	623	682	886	661	713
May	655	803	878	768	776
June	830	950	915		898
July	913	950	795		886
August	834	947	900		894
September	930	950	948		843
October	829	866	843		846
November	788	920	721		810
December	707	950	763		807
Average	759	866	868	705	816

TABLE 3.4-6

PROCESS WASTE CHARACTERIZATION

	Units	Cooling Tower Blowdown	Oil/ Water Separator Effluent	Precip-itation	Discharge to 001	Current Discharge Limits
Flow	kgpd	247	11	25	3,339	--
Ca	mg/l	319	61	0	76	--
Mg	mg/l	102	14	0	24	--
Na	mg/l	640	44	0	152	--
K	mg/l	83	3	0	20	--
M. Alk as $CaCO_3$	mg/l	122	215	10	288	--
C1	mg/l	463	34	0	110	190
SO_4	mg/l	1754	61	0	217	300
NO_3	mg/l	141	17	0	33	--
$C1_2$	mg/l	0.2	--	0	0.2	0.2
SiO_2	mg/l	23	21	0	30	--
TSS	mg/l	15	0	0	15	15
TDS	mg/l	3980	0	10	949	950
Inhibitor	mg/l	42	--	0	56	--
Fe	mg/l	0.166	0.051	0	0.22	0.300
Cu	mg/l	0.001	0.007	0	0.009	0.011
Al	mg/l	0.006	0.050	0	<1	1
PO_4	mg/l	0.17	0.10	0	<5	5
pH	S.U.	6 to 9	8	6.5	6 to 9	6.5 to 9.0
Conductivity	μS/cm	--	600	10	--	958
CTG BD below = 1.5* PWD Monthly Monitoring Report Value, Discharge 002, except < values are shown						
Turbidity	NTU	--	--	--	2	2
Temperature	^oF	65 to 82	--	--	100	100
BOD_5	mg/l	--	--	--	<20	20
O/G	mg/l	<2	--	--	<10	10
Settlable Solids, SS	mg/l	--	--	--	0.1	0.1
CN	mg/l	<0.02	--	--	<5.2	5.2
S	mg/l	--	--	--	--	--
B	mg/l	1.5	--	--	1.5	1.5
F	mg/l	0.8	--	--	<2	2.0
Det, MBAS	mg/l	--	--	--	<0.5	0.5
NO_2-N	mg/l	--	--	--	0.9	1
NO_2-N+NO_3-N	mg/l	--	--	--	6	8
NH_3	mg/l	27	--	--	27	10
Organic-N	mg/l	<2.5	--	--	<2.5	--
Ba	mg/l	0.006	0.081	--	<1	1.0
Mn	mg/l	0.084	0.016	--	0.02	0.050
As	mg/l	0.003	--	--	<0.05	0.050
Cd	mg/l	<0.010	--	--	0.001	0.001
Cr	mg/l	0.013	0.010	--	<0.2	0.2
Pb	mg/l	<0.050	--	--	<0.0025	0.0025

TABLE 3.4-6 (CONTINUED)

PROCESS WASTE CHARACTERIZATION

	Units	Cooling Tower Blowdown	Oil/ Water Separator Effluent	Precip-itation	Discharge to 001	Current Discharge Limits
Hg	mg/l	<0.0002	--	--	<0.000012	0.000012
Ni	mg/l	0.000	0.000	--	<0.1	0.10
Se	mg/l	<0.002	--	--	<0.005	0.005
Ag	mg/l	<0.050	--	--	<0.0034	0.0034
Zn	mg/l	0.277	0.208	--	<1	1
Co	mg/l	<0.050	--	--	<0.050	--
PCB	mg/l	<0.0002	--	--	--	None
Endrin	mg/l	<0.000005	--	--	<0.000005	0.0000023
Lindane	mg/l	<0.000005	--	--	<0.000005	0.0001
1,4-dichlorobenzene	mg/l	<0.003	--	--	<0.003	0.005
Bis (2-ethylhexyl)-phthalate	mg/l	0.086	--	--	0.116	0.004
1,2-dichloroethane	mg/l	<0.0005	--	--	<0.0005	0.0005
Chloroform	mg/l	0.007	--	--	0.007	0.100
Ethylbenzene	mg/l	<0.0005	--	--	<0.0005	0.700
Toluene	mg/l	<0.0005	--	--	<0.0005	0.150
Tetrachloroethylene	mg/l	<0.0005	--	--	<0.0005	0.005
Methylene chloride	mg/l	<0.003	--	--	<0.003	0.005
Bromoform	mg/l	<0.001	--	--	<0.001	0.100
Bromodichlore-methane	mg/l	<0.0005	--	--	<0.0005	0.100
Dichlorobromo-methane	mg/l	<0.0005	--	--	<0.0005	0.100
2,4-D	mg/l	<0.0004	--	--	<0.0004	0.070
2,4,5-TP Silvex	mg/l	<0.00002	--	--	<0.00002	0.010
Nitrobenzene	mg/l	--	--	--	--	--
2,4-chlorophenol	mg/l	--	--	--	--	--
Phenol	mg/l	0.030	--	--	0.030	--
Methoxychlor	mg/l	<0.000005	--	--	<0.000005	--
MTBE	mg/l	0.0015	--	--	0.0015	--
DDT	mg/l	<0.000005	--	--	<0.000005	--
PAH	mg/l	<0.004	--	--	<0.004	--
Remaining Priority Pollutants	mg/l	--	--	--	PQL	None Detected

3.4.7.6 Water Pretreatment

The MPP will have the capability to disinfect reclaimed water prior to direct use as cooling tower makeup. Local groundwater must be treated to remove VOC's and may require treatment to reduce hexavalent chromium. The VOC's will be removed by activated carbon filters. The hexavalent chromium can be removed by reduction with sulfur dioxide and the settling and filtration to remove the trivalent chromium. Domestic water will be supplied through an interconnection with the COB's existing distribution system and will not require pretreatment.

3.4.7.6.1 Cooling Tower Makeup Water. There will be one cooling tower for the facility. The tower will provide heat rejection for the facility's steam turbine cycle.

The majority of the makeup water will be reclaimed water. For design purposes, the makeup water will have a total dissolved solids content of 732 mg/l. The circulating water will be continuously treated and controlled in order to maintain chemical concentrations in the circulating cooling water below levels that would be deleterious to the MPP systems. Based on makeup water analyses, silica will normally be the controlling species. It is desired to maintain the silica concentration less than 150 mg/l. This can be achieved for the design case by operating the cooling tower at about 5.6 cycles of concentration. The cycles of concentration will vary according to the makeup water composition but will generally be maximized in order to reduce treating chemical consumption.

3.4.7.6.2 Circulating Water Treatment. A circulating water chemical feed system will supply water-conditioning chemicals to the circulating water system to minimize corrosion and to control biofouling. To prevent ground contamination, all circulating water chemicals will be stored in double contained storage tanks.

Sulfuric acid will be fed into the circulating water system for alkalinity reduction and pH adjustment in order to control the scaling tendency of the circulating water. The acid feed equipment will consist of a bulk sulfuric acid storage tank and two full-capacity, piston-diaphragm sulfuric acid metering pumps.

To minimize biofouling in the circulating water system, sodium hypochlorite will be shock fed into the system as a biocide. The hypochlorite feed equipment will consist of a bulk storage tank and two full-capacity, piston-diaphragm inhibitor metering pumps. Residual chlorine in the blowdown water will be minimized by the design of the chlorination/dechlorination system and its operation. Proprietary biocide will be available onsite for direct feed into the circulating water system to control algae, if necessary. Dechlorination will be used to ensure that the discharge through outfall No. 001 to the Burbank Western Channel is compliant with the permit limitations.

At 5.6 cycles of concentration, it is estimated that the circulating water will have a total dissolved solids content of approximately 3750 milligrams per liter. The cooling tower blowdown will be returned to the reclaimed discharge line prior to Outfall No. 001. The outfall will not exceed the TDS discharge limitations of 950 mg/L.

TABLE 3.4-7

ESTIMATED LIQUID PROCESS WASTE VOLUMES TO RECLAIM DISCHARGE LINE AND TO LOCAL SEWER

Waste Stream	Source	Typical Wash Volume[1]	Peak Flows	Sewer Volume
Cooling Tower Blowdown	Cooling tower reclaim water makeup, evaporative cooler blowdown, SCR regeneration water, boiler blowdown.	247,000 gal/day	500 gpm	
Uncontaminated Precipitation Runoff[3]	Weather	25,000 gal/day	150 gpm	
Reclaim Discharge Line	Reclaim Plant	3,067,000 gal/day	8,300 gpm	
Total to Discharge 001		3,339,000 gal/day	8,300 gpm	
Oil/Water Separator Effluent	Plant and equipment drains contaminated precipitation runoff		100 gpm[2]	11,000 gal/day
Sanitary Drains	Domestic wastes		50 gpm	2,000 gal/day
Total to Local Sewer			150 gpm	13,000 gal/day

1 All numbers are approximate and are based on 64° F annual average ambient temperature and full load operation.

2 Excluding precipitation runoff.

3 Only precipitation runoff from areas with potential oil contamination go to the oil/water separator.

TABLE 3.4-8

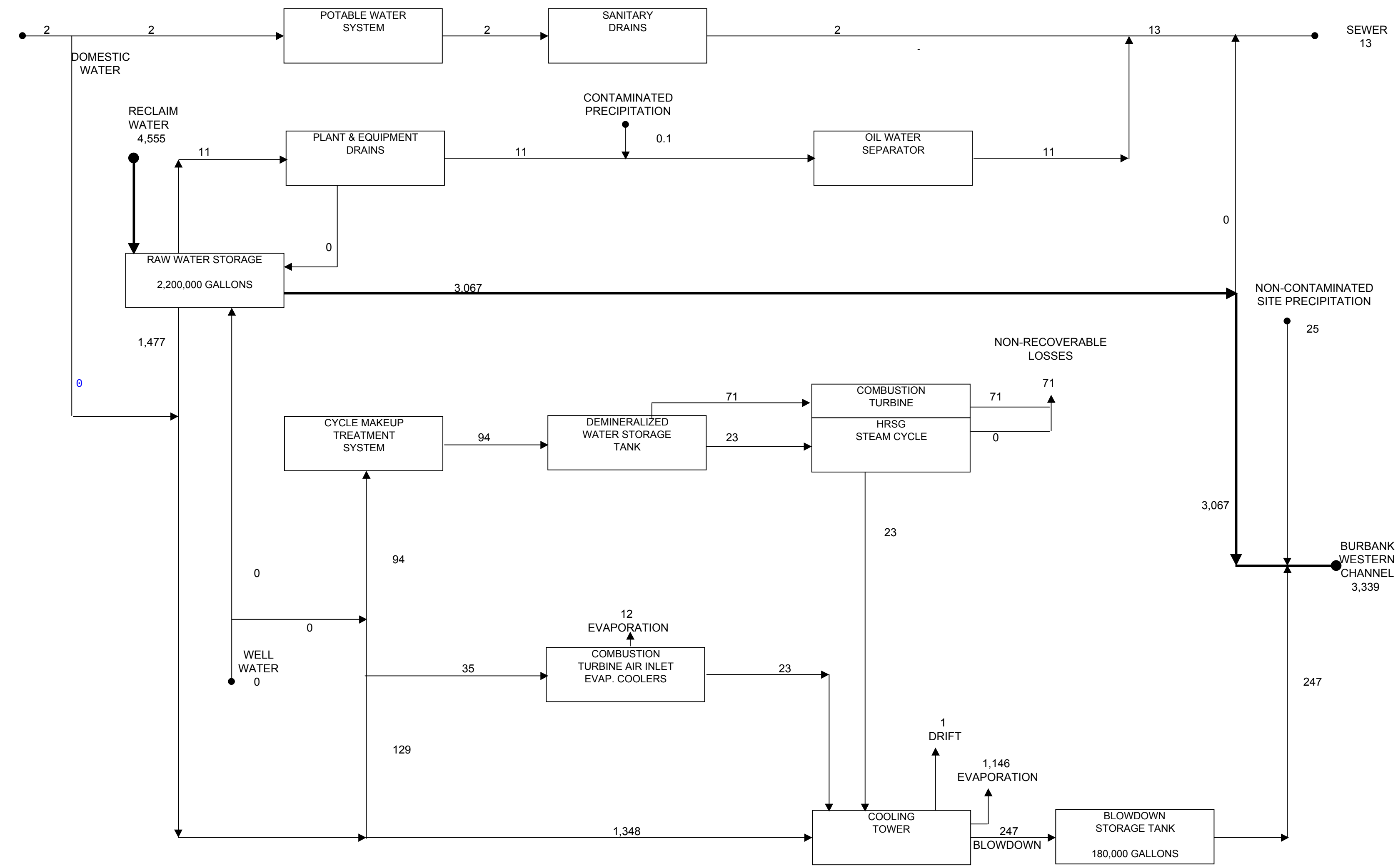
COOLING TOWER OPERATING CHARACTERISTICS

Parameter	Cooling Tower[1] Average	Evaporative Coolers
Circulating Water, gpm	103,000	1,650
Number of Cells	6	--
Makeup, gpm	968	24
Blowdown, gpm	172	16
Drift, gpm	1	--
Evaporation plus Drift, gpm	797	8

1 All numbers are approximate and are for 64° F day conditions and full load operation.

3.4.7.6.3 Cycle Makeup Water Treatment. Prior to use as makeup to the HRSG/ST steam cycle, additional treatment of reclaimed water by demineralization will be required. Reclaimed water will be directed to the cycle makeup treatment system to produce high quality demineralized water for makeup to the steam cycle and for miscellaneous plant uses. This system will include a leased mobile demineralizer utilizing off-site regeneration facilities. Demineralized water produced will be directed to a demineralized water storage tank for storage and use. If the quality of the reclaim water will damage deminerlizing equipment, the MPP will rely on COB water. This estimated amount is shown in Table 3.4-1A.

3.4.7.6.4 Cycle Chemical Feed System. The cycle chemical feed system will supply water-conditioning chemicals to the HRSG/ST steam cycle to minimize corrosion. The system will feed an oxygen scavenger and a neutralizing amine to the feedwater and condensate, respectively, for dissolved oxygen control and cycle pH control. The design will provide for automatic feed of oxygen scavenger and amine in proportion to feedwater and condensate flow rates, respectively. This method of treatment is referred to as all volatile treatment and is often employed for once-through design steam generators.



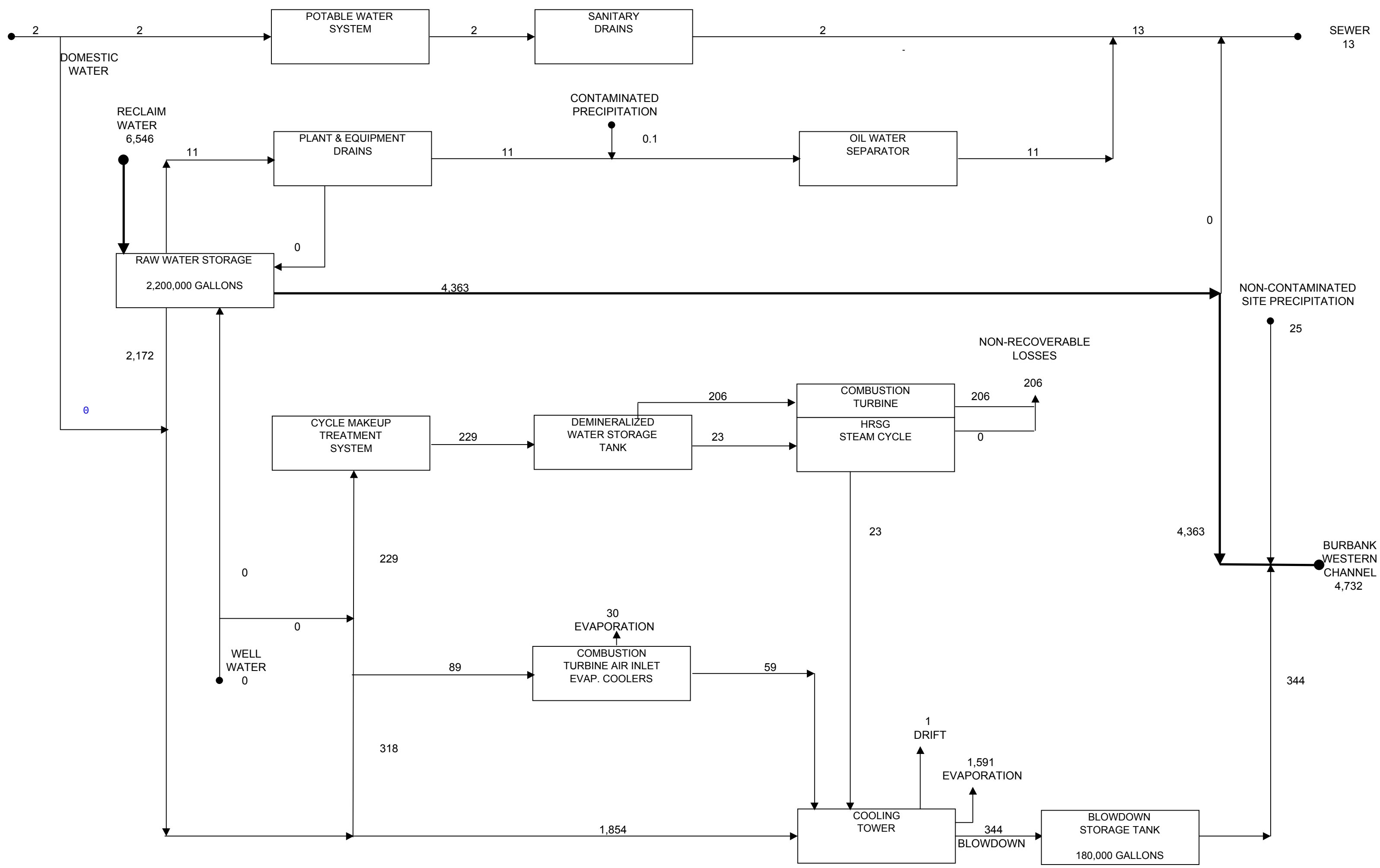
NOTES:

1. ALL FLOWS ARE ESTIMATED IN 1,000 GPD.
2. FLOWS ARE BASED ON 100% LOAD BURNING NATURAL GAS, 64 F DBT TEMPERATURE, 26 % RELATIVE HUMIDITY. DUCT FIRING 1000 HRS/YR
3. COOLING TOWER CYCLES 5.62

—● INDICATES A CONNECTION OUTSIDE THE NPDES BOUNDARY

→ INDICATES A CONNECTION INSIDE THE NPDES BOUNDARY

Magnolia Power Project	**Source: Bibb & Associates**	**Figure 3.4-5A WATER BALANCE (ANNUAL AVERAGE) USING 100% RECLAIMED WATER**	**Nov. 2001**

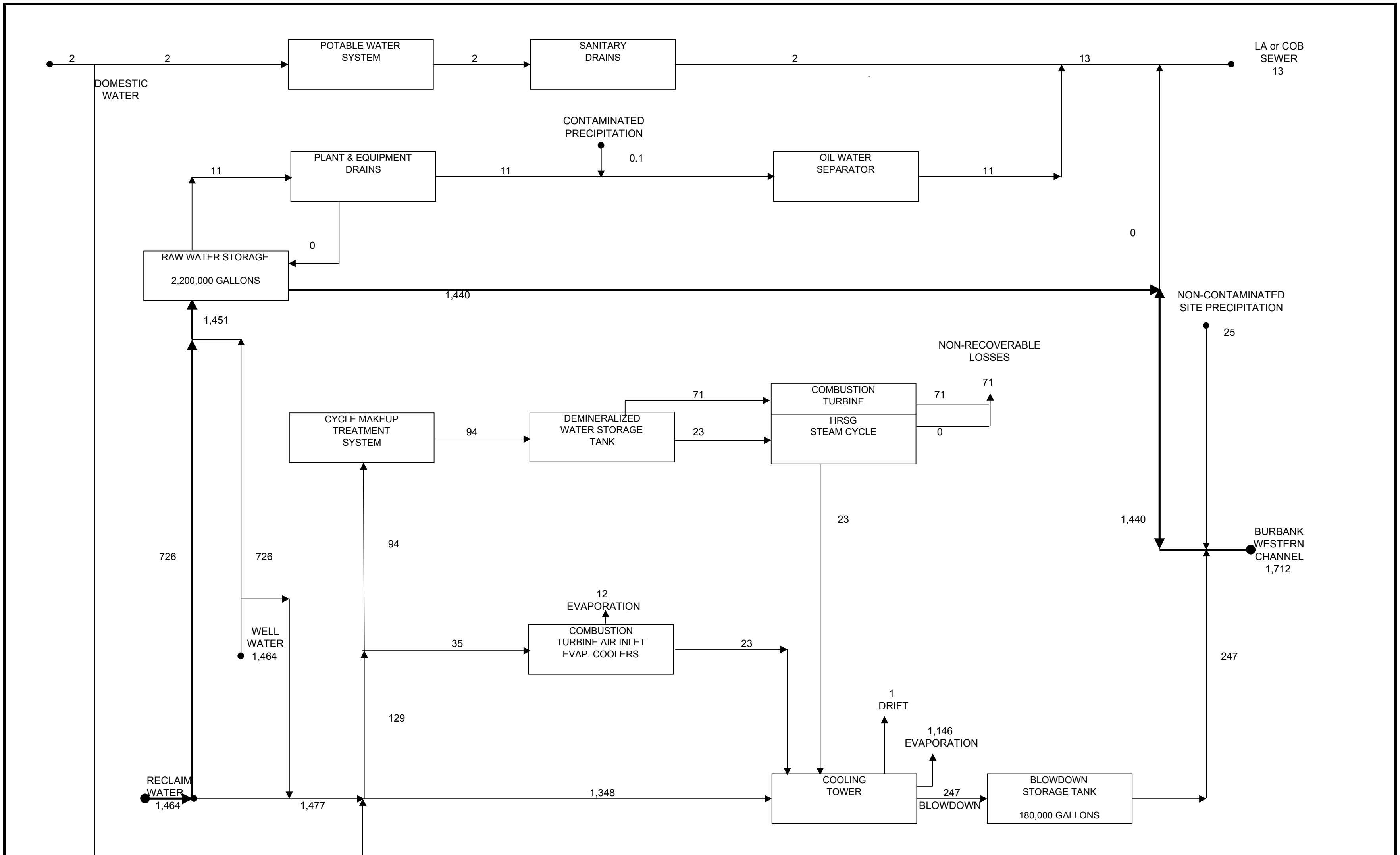


NOTES:

1. ALL FLOWS ARE ESTIMATED IN 1,000 GPD.
2. FLOWS ARE BASED ON 100% LOAD BURNING NATURAL GAS, 81 F DBT TEMPERATURE, 26 % RELATIVE HUMIDITY. DUCT FIRING 12 HRS/DAY
3. COOLING TOWER CYCLES 5.62

INDICATES A CONNECTION OUTSIDE THE NPDES BOUNDARY
INDICATES A CONNECTION INSIDE THE NPDES BOUNDARY

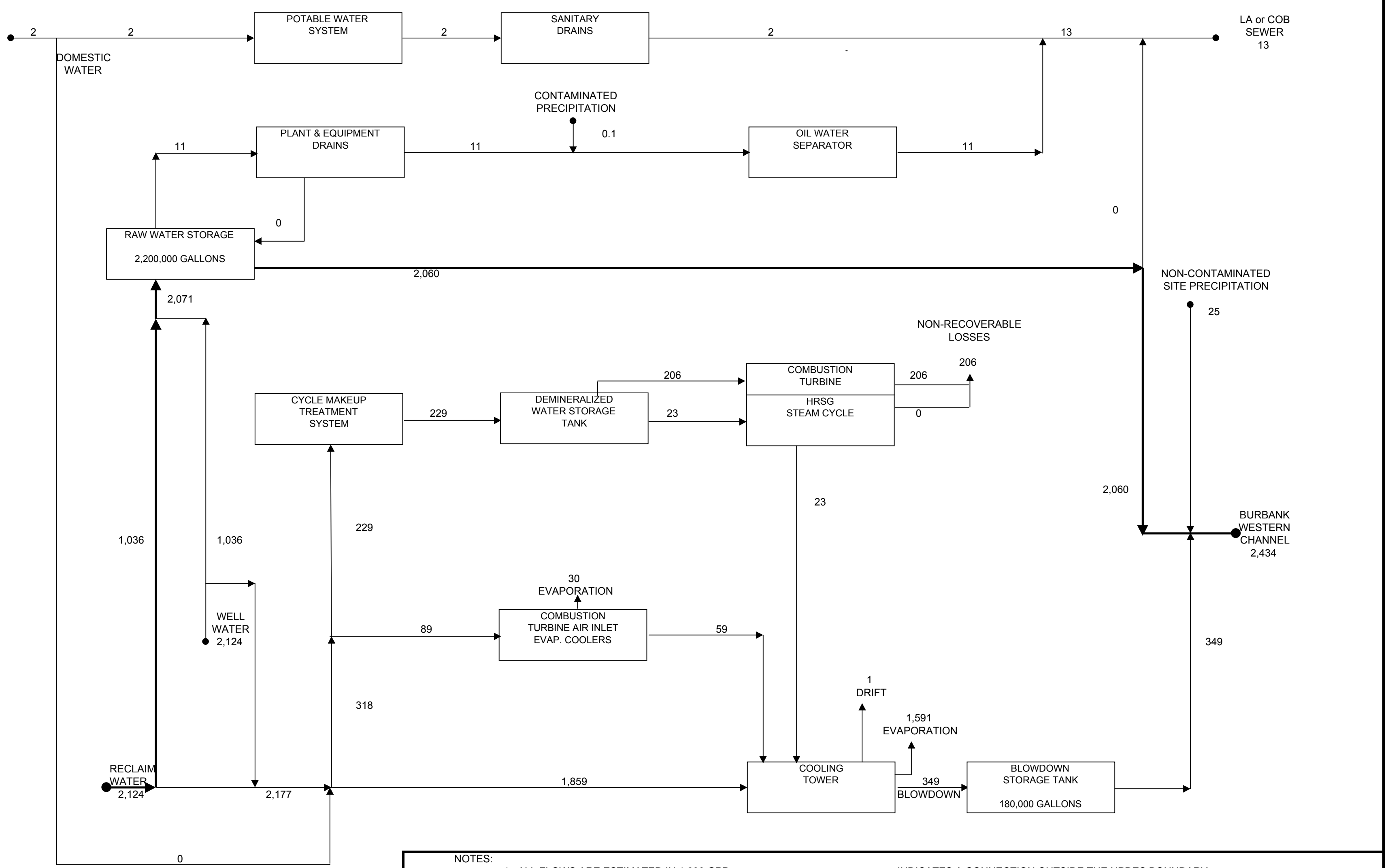
Magnolia Power Project	Source: Bibb & Associates	Figure 3.4-5B WATER BALANCE (MAXIMUM DAILY) USING 100% RECLAIMED WATER	Nov. 2001



NOTES:
1. ALL FLOWS ARE ESTIMATED IN 1,000 GPD.
2. FLOWS ARE BASED ON 100% LOAD BURNING NATURAL GAS, 64 F DBT TEMPERATURE, 26 % RELATIVE HUMIDITY. DUCT FIRING 1000 HRS/YR
3. COOLING TOWER CYCLES 5.62

INDICATES A CONNECTION OUTSIDE THE NPDES BOUNDARY
INDICATES A CONNECTION INSIDE THE NPDES BOUNDARY

Magnolia Power Project	Source: Bibb & Associates	Figure 3.4-5C WATER BALANCE (ANNUAL AVERAGE) USING 50% RECLAIMED AND 50% WELL WATER	Nov. 2001



NOTES:

1. ALL FLOWS ARE ESTIMATED IN 1,000 GPD.
2. FLOWS ARE BASED ON 100% LOAD BURNING NATURAL GAS, 81 F DBT TEMPERATURE, 26 % RELATIVE HUMIDITY. DUCT FIRING 12 HRS/DAY
3. COOLING TOWER CYCLES 5.62

—● INDICATES A CONNECTION OUTSIDE THE NPDES BOUNDARY
—▶ INDICATES A CONNECTION INSIDE THE NPDES BOUNDARY

Magnolia Power Project	**Source: Bibb & Associates**	**Figure 3.4-5D WATER BALANCE (MAXIMUM DAILY) USING 50% RECLAIMED AND 50% WELL WATER**	**Nov. 2001**

5.5 WATER RESOURCES

5.5.1 Affected Environment

The Magnolia Power Project (MPP) is located in the City of Burbank (COB), Los Angeles County, California. The project will be constructed at an existing power plant site operated by the COB. The MPP site is located at 164 West Magnolia Boulevard, which is situated approximately one-eighth mile west of the I-5 freeway. The site is bordered by industrial properties on all sides. The COB site is approximately 23 acres in size. The project site will require approximately 3.0 acres.

5.5.1.1 Magnolia Power Project Energy Facility

5.5.1.1.1 Water Supply. The project's primary water supply will be **r**eclaimed water supplied to the MPP via the existing connection with the COB Public Works Department Reclamation Plant wastewater discharge line to Outfall No. 001. As described in more detail in Section 3.4.7, the MPP will also have a back-up water supply from the COB. The back-up water supply will be used for power plant cooling only when the Reclamation Plant experiences an upset for a period greater than 8 hours. The back-up water supply will also be used if the quality of the reclaimed water is insufficient for use as demineralized make-up water. The back-up water supply will be delivered by the COB to MPP via the existing COB domestic water distribution system. The COB has provided a will serve letter to supply the reclaimed water as well as domestic water. The domestic water supply will be for potable uses and as a secondary (backup) source of water for cycle makeup. The COB obtains this supply from SWP, Colorado River and/or local groundwater, and COB has indicated that its first priority for delivery to the MPP would be from local groundwater wells. Domestic water from the COB will be used regularly for potable purposes and in the Fire Protection System.

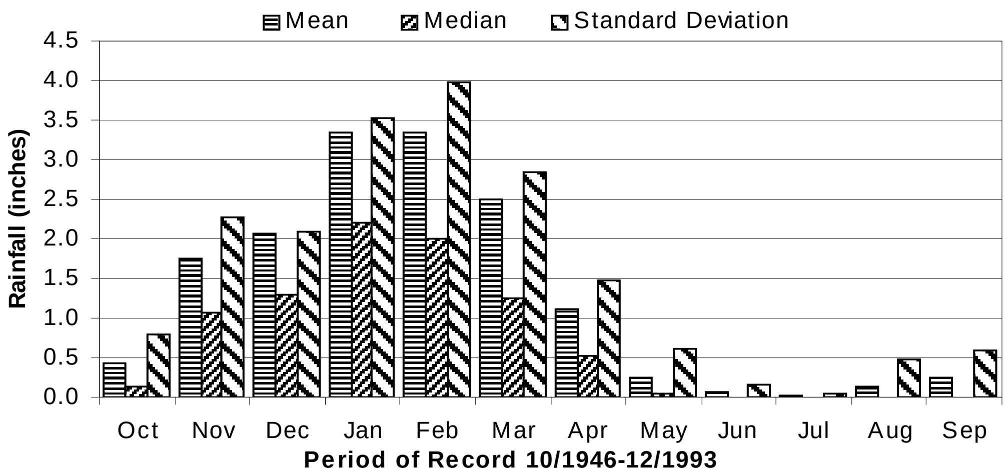
5.5.1.1.2 Hydrology

Hydrologic Setting. The Magnolia Power Project site is located in the San Fernando Valley, which is within Upper Los Angeles River Area (ULARA). The ULARA encompasses the entire watershed of the Los Angeles River and its tributaries above a point in the river designated as Los Angeles County Department of Public Works (LACDPW) Gauging Station F-57C-R (near the junction of the Los Angeles River and the Arroyo Seco). The climate in the San Fernando Valley is semi arid. Winters and springs are generally mild and breezy with daytime temperatures ranging from 60° F to 70° F. Summers are hot with daytime temperatures that occasionally exceed 100° F. The fall seasons are typically warm and windy with daytime temperatures in the 70° to 80° F range. Rainfall occurs primarily between November and April and averages 14.67 inches per year. Figure 5.5-1 summarizes the monthly rainfall data recorded during the period of record from October 1946 to

December 1993 at the California Data Exchange Center's Burbank Valley Pump Plan station. Mean monthly rainfall values are greater than the median rainfall values for each month during the wet season indicating that very wet months are unusual.

FIGURE 5.5-1

STATISTICAL SUMMARY OF RAINFALL DATA RECORDED AT THE BURBANK VALLEY PUMP PLAN STATION



The only surface water feature of significance near the Magnolia Power Project site is the Burbank Western Channel. The flow from this channel originates from the westerly slopes of the Verdugo Mountains and from east of Lankershim Boulevard and feeds into the Los Angeles River. The Burbank Western Channel is lined with concrete from above the COB Reclamation Plant to the confluence with the Los Angeles River. Gauging Station E-285-R registers flow in the Burbank Western Channel. The gauging station also records any releases from industrial facilities and the reclaimed wastewater discharged by the City of Burbank. Table 5.5-1 summarizes the monthly runoff volume recorded at the Burbank Western Channel gauging station E-285-R during the hydrologic years of 1992-1993 and 1993-1994 (Watermaster, 1995). The Burbank Western Channel is on the 1998 State Water Resources Control Board 303d list as an impaired water body. It is listed for ammonia, cadmium, trash, odors, algae and unnatural scum/foam.

TABLE 5.5-1

MONTHLY RUNOFF VOLUME AT GAUGING STATION E-285-R (ACRE FEET)

Wet Season	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun	July	Aug	Sep	Total
1993-1994	654	1,018	1,038	865	3,007	1,875	709	596	662	674	545	512	12,155
1992-1993	1,068	532	3,725	5,802	6,357	3,028	772	555	909	711	588	520	24,567

The ULARA has four distinct ground water basins. The water supplies of these basins are separate and are replenished by deep percolation from rainfall, surface runoff and from portions of the water that is delivered for use within these basins. The four basins are San Fernando, Sylmar, Verdugo, and Eagle Rock Basins. The San Fernando basin, the largest of the four basins, directly underlies the Magnolia Power Project site. This basin is bounded on the east and northeast by the San Rafael Hills, Verdugo Mountains, and San Gabriel Mountains; on the north by the San Gabriel Mountains and the eroded south limb of the Little Tujuna Syncline which separates it from the Sylmar Basin; on the northwest and west by the Santa Susana Mountains and Simi Hills; and on the south by the Santa Monica Mountains (Watermasters, 1995). In general, the groundwater flow direction in this basin is towards the southeast.[1]

100-Year Flood Plain. The Los Angeles River is located approximately one mile south of the project site. The site is in Zone C, an area determined to be outside the 500-year floodplain. Because the site is outside the 500-year flood plain, the hazard for flooding is negligible.

Surface Waters. The existing plant site is fully developed and impervious. Storm runoff from this area is currently collected through a system of drop inlets and storm drainpipes to a 36-inch storm drain line that discharges to the Burbank Western Channel through Outfall No. 001.

5.5.1.2 Pipelines

5.5.1.2.1 Water Supply Line. The project site has existing reclaimed and domestic water pipelines.

5.5.1.2.2 Wastewater Discharge Line. Reclaimed wastewater from the COB site is discharged to the Burbank Western Channel through Outfall No. 001 located at the northeastern boundary of the facility. The Burbank Western Channel is a tributary to the Los Angeles River. This discharge of reclaimed wastewater is permitted by the Regional Water Quality Control Board – Los Angeles Region (RWQCB) under National Pollutant Discharge Elimination System (NPDES) Permit No. CA0055531. Approximately five million gallons per day (MGD) of wastewater is discharged to the Burbank Western Channel consisting of:

- Surplus effluent from the Burbank Water Reclamation Plant;
- Power plant cooling water blowdown;
- Storm water; and
- Boiler drainage.

[1] Blevins, M.L., Kavounas, P. and J.F. Mann, Jr. Watermaster Service in the Upper Los Angeles River Area, Los Angeles County, 1993-1994 Water Year. May, 1995.

Wastewater effluent from POTWs makes up approximately 70% of the base flow of the Los Angeles River at downtown Los Angeles and the base flow fluctuates between 90 and 300 cfs, reflecting the diurnal cycles of effluent production.[2] The combined COB discharge from Outfall Nos. 001 and 002 constitute 2 – 8% of the base flow of the lower reach of the Los Angeles River. The characteristics of the COB effluent from Outfall No. 001 in 1997 are shown in Table 5.5-2.

TABLE 5.5-2

COB EFFLUENT OUTFALL NO. 001 CHARACHERISTICS (1997)

Constituent	Unit	Annual Average	Monthly Average
Temperature	° F	71	---
BOD5 20° C	Mg/L	8.0	---
Suspended solids	Mg/L	3.2	---
Settleable solids	ml/L	<0.1	<0.1
Total dissolved solids	Mg/L	---	675

RWQCB staff stated that authorization to return cooling tower blowdown to the Reclamation Plant discharge line under the existing NPDES permit will be approved. In a letter to SCPPA, RWQCB affirms the Magnolia Power Project can be covered under the existing NPDES permit, and substantial changes, if any, would need to be incorporated into the permit through the NPDES permit renewal process. In addition, the COB has authorized the return of cooling tower blowdown to the Reclamation Plant discharge line under this permit.

Sanitary wastes are discharged to the sanitary sewers operated by the COB.

5.5.1.3 Access Road

Primary access to the facility is provided via an entrance on Lake Street.

5.5.2 Environmental Consequences

5.5.2.1 Magnolia Power Project

The MPP is a proposed nominal 250 MW natural gas fired electrical generating facility to be located at the site of the existing COB power plant. The entire project, including ancillary facilities (fuel supply, water supply, wastewater discharge and electrical transmission), will

[2] Rod Kubomoto, Los Angeles County Department of Public Works, personal communication.

be completely contained within the boundaries of the existing site. This site has operated as an electrical generating facility at this location since 1941.

The proposed project will be constructed on approximately 3.0 acres of the existing 23-acre COB site, located at 164 Magnolia Boulevard in Burbank, California. A 2.4-acre offsite laydown area will be located two miles to the northwest of the MPP site. The project includes a power island, switchyard upgrades to the existing Olive switchyard control and administrative buildings, a wet mechanical-draft cooling tower, storage tanks, natural gas compressors, and other ancillary facilities. The project also includes onsite pipelines for natural gas supply, water supply, wastewater return to the COB Reclamation Plant wastewater discharge line, site access, and parking. No offsite pipelines are involved.

The Project will include the following systems:

- **Boiler Feedwater System.** The condensate pumps (2 x 100%) will transfer feedwater from the condenser hot well to the deaerator. The boiler feedwater pump (2 x 100%) will provide water from the LP drum to the high pressure (HP) and LP sections of the HRSG. Makeup to this system will be produced from domestic water onsite with mobile demineralization equipment.

- **Main Condenser.** The main condenser condenses steam and cools and deaerates the condensate to a level suitable for introduction into the HRSG. It will be a single shell, two-pass, nondivided water box condenser, with 316 stainless steel (SS) tubes. The tube surface will be designed with extra capacity for fouling, and to permit temporary plugging of leaking tubes so that complete repair can be accomplished during scheduled outages. The condenser air removal system will consist of steam powered air eductors and/or mechanical vacuum pumps for both hogging and holding of condenser vacuum. Redundant air removal equipment will be provided.

- **Cooling Tower and Circulating Water System.** The cooling tower cools the circulating water and makes it suitable for cooling the main condenser and the auxiliary equipment. Three (33% capacity) circulating water pumps will supply cooling water to the main condenser. The cooling system will be designed for two of the cooling tower cells or one of the circulating water pumps to be out of service for maintenance without significantly affecting electrical output. The STG and CTG can be operated at reduced loads if several of the cooling tower cells are out of service. There will be a total of six cells in the cooling tower structure.

- **Closed Cooling Water System.** This system will provide water for cooling balance-of-plant components such as the air compressors and bearing coolers. Heat is rejected in the cooling tower. Redundant closed cooling water pumps and heat exchangers will be provided.

- **<u>STG Cycle Makeup and Storage System</u>.** This system transfers water from a demineralizer to storage tanks to the condenser. The storage capacity in the demineralized water storage tank will provide feedwater makeup if the demineralized water supply is curtailed for a short time.

- **<u>Reclaim Water Storage Tank</u>.** In order to manage the diurnal fluctuations in the available volume of reclaimed water, MPP will incorporate a 2.2 million gallon influent reclaimed water storage tank. MPP will use an existing 2.2 million gallon tank that is currently located underground beneath the Olive 2 cooling tower. This tank was used by the COB to store fuel oil and has been drained and decommissioned and is no longer in use. The MPP will line this tank to make it suitable for reclaimed water storage. During times of peak reclaimed water flows, the tank will be filled in order to create a reserve for times of reduced reclaimed water flow. The tank will allow the MPP to operate at peak load for periods of 8 hours or longer without delivery of reclaimed water from the Reclamation Plant. The incorporation of this tank is a significant non-reclaimed water saving measure that will eliminate the potential for a daily reliance on supplemental non-reclaim water sources during diurnal variations.

- **<u>Cooling Tower Blowdown Tank</u>.** Operators of the COB Reclamation Plant advise that upsets of half-day duration do occur once or twice a month and upsets lasting a day or longer do happen two to four times per year. During upsets of the COB Reclamation Plant, use of the Cooling Tower Blowdown Tank will enable the MPP to retain the blowdown stream until such time that return of the blowdown will not cause the COB discharge to Outfall No. 001 to exceed its NPDES discharge limitations.

<u>Demolition and Construction</u>. Construction of the plant from site preparation and grading to commercial operation is anticipated to commence in mid to late 2002 and proceed for approximately 23 months. Areas within the site boundary will be used as off-load and staging areas. Additional lay-down space may be required offsite to temporarily store construction materials and plant equipment prior to installation. Additional offsite lay-down space is being studied. These sites are typically existing asphalt paved storage or parking areas. Temporary offsite storage for large components may be procured near the closest rail station or transportation hub.

Materials and equipment staging areas are needed for construction. These areas serve as base stations where employees report at the start and end of each day's activities. Staging areas are used for other activities and functions including field office locations, lay-down areas, storage of materials, storage of equipment and vehicles, the mechanic's garage, and security of the above items. These staging areas will be located on the project site during the detailed design phase of the project.

Construction water will be provided by the COB from local supply and will be provided to the construction area.

Drinking water will be distributed daily. Average daily use of construction water is expected to be about 5,000 gallons. During hydrotest, water usage is estimated at 20,000 gpd. Used hydrotest water will be discharged into the storm drainage system. Portable toilets will be provided throughout the site.

Construction Site Runoff. Approximately ten acres of land will be disturbed in the construction of the MPP. The quality of the storm water runoff will be managed through the implementation of Best Management Practices (BMPs) specified in the Construction Storm Water Pollution Prevention Plan (SWPPP) and compliance with storm water quality management requirements established by the COB.

Heat Rejection System. Power cycle heat rejection will consist of a two-pass deaerating surface condenser, a circulating water system, a closed loop auxiliary water system, and a conventional evaporative cooling tower array. The condenser and its auxiliaries will be designed to accept STG bypass flow during unit startup. The circulating water system will provide cooling water for condenser heat rejection as well as for auxiliary cooling water. The cooling water tower will be counter-flow, mechanical draft, plastic fill design.

Dry, air-cooled condensers were considered, but they are much more expensive and cause a meaningful loss in plant efficiency. In addition, potential space, noise and visual impacts have been identified. As long as the reclaimed water is available, the wet cooling tower is the best alternative.

5.5.2.1.1 Water Supply and Treatment. The MPP will use a combination of sources for the water supply. The primary source will be reclaimed water delivered to the site from the nearby COB Reclamation Plant. The reclaimed water will be obtained via the existing wastewater discharge pipeline connecting the COB water reclamation plant to Outfall No. 001. The existing COB steam plant also obtains reclaimed water from this wastewater discharge pipeline. MPP will maximize use of the reclaimed water to limit reliance on non-reclaimed water sources. Non-reclaimed water sources include potable and non-potable sources delivered to the site by COB. The MPP will use reclaimed water for power plant cooling and for makeup for demineralized water when its quality will not damage the demineralizing equipment. However, there will be times when the MPP will either have to supplement its water supply with non-reclaimed sources supplied by the COB or will have to solely rely on non-reclaimed sources. In general these conditions will be limited to those periods when the COB Reclamation Plant is experiencing upset conditions for periods longer than 8 hours or when the quality of the reclaimed water prevent its use as makeup water for the demineralizer. As shown in Table 5.5-4, the expected annual average water requirements for the project are 4,668 acre-ft/yr of reclaim water, 434 acre-ft/yr non-reclaim water for power plant cooling during upset Reclamation Plant upset conditions, 105 acre-ft/yr non-reclaim water for demineralizer make-up, and 2.2 acre-ft/yr of domestic water. The expected daily water supply requirements are summarized in Table 5.5-4. Daily, annual, and maximum water balances are contained in revised Section 3.4.7 Figures 3.4-5A, 3.4-5B, and 3.4-5C.

The MPP will utilize reclaim water as the primary supply with domestic supply for potable uses and fire water. Well water and domestic water will provide a backup supply for makeup for the demineralizer when the reclaim water is of such poor quality that it will damage the demineralizing equipment. Coincidentally, the COB is also pursuing a retrofit to the reclaim water plant that may significantly improve the reclaim water quality and quantity. When the retrofit is completed, the volume of reclaim water will likely increase and the frequency of plant upsets may be reduced. This retrofit, which is unrelated to the MPP, would likely reduce MPP's reliance on non-reclaimed water sources. The discharge quality shown in Table 3.4-6 takes into account the effects of this retrofit in terms of reducing the level of nitrogen and heavy metals at the COB Reclamation Plant.

COB Reclaim Water Treatment Plant Effluent. The project will utilize reclaimed water purchased from the COB and supplied by the Public Works Department under long-term contract. Reclaimed water from the COB, approximately 1.2 MGD of recirculated cooling water, will be consumed on average to reject heat from the steam condenser. Reclaim water will be used as makeup to the circulating cooling water systems. In addition, the reclaimed water will be used as the feed supply to the demineralizer water treatment trailers to be installed at the MPP site. These trailers will produce the demineralized water needed (about 0.1 MGD on average) in the combustion turbine and as makeup to the boiler feedwater cycle. COB will serve the project primarily from the reclaimed water system onsite.

The COB operates a reclaim water treatment plant that produces water of sufficient quality to discharge into the Burbank Western Channel, a tributary to the Los Angeles River. The treatment plant has a capacity of 9.0 million gallons per day (MGD) average and 12.0 MGD instantaneous peak, but the current average daily flow is approximately 8 MGD. As such, the COB Reclamation Plant has demonstrated the capacity to produce reclaimed water at a rate equivalent to about 4% of the overall water supply for the COB. As shown in Table 5.5-3, over the past five years the average reclaim water usage in acre-feet (AF) was 464 AF to irrigation use and 355 AF to the existing Power Plant. All the excess reclaimed water production (5,674 AF) was wasted to the Burbank Western Channel.

TABLE 5.5-3

RECLAIMED WATER USAGE (AF)
COB RECLAMATION PLANT

MONTH	POWER PLANT[1]	CAL TRANS	MEDIA CITY CTR	LAND FILL	DEBELL GOLF	MUIR SCHOOL	McCAM PARK	WATER TRUCKS	MONTHLY TOTALS USED[1]	MONTHLY TOTALS LANDSCAPE[2]
1996										
JAN	3.0	0.0	1.0	4.6	5.3	0.0		0.0	13.8	10.9
FEB	10.5	0.0	0.9	1.4	3.0	0.8		0.2	16.8	6.1
MAR	23.1	0.0	0.8	1.3	5.7	0.6		0.0	31.4	8.3
APR	10.1	0.0	0.8	4.6	15.3	1.3		0.1	32.3	22.1
MAY	2.1	0.0	2.0	8.8	27.0	2.3		0.0	42.3	40.2
JUN	17.3	0.5	3.3	7.4	42.6	2.2		0.0	73.3	56.0
JUL	22.8	0.5	2.8	12.0	51.2	2.4		0.0	91.7	68.9
AUG	69.3	0.7	2.8	9.9	44.8	2.1		0.0	129.5	60.2
SEP	65.2	0.8	3.0	8.0	39.8	0.7		0.1	117.6	52.3
OCT	50.8	0.0	2.7	9.6	34.7	3.0		0.0	100.8	50.0
NOV	26.3	0.0	2.2	4.9	14.2	0.9		0.0	48.4	22.1
DEC	21.9	0.0	2.0	4.1	13.0	0.4		0.0	41.4	19.5
TOTAL	322.3	2.5	24.2	76.7	296.5	16.6	0.0	0.5	739.3	416.5
1997										
JAN	17.6	0.0	0.8	1.6	2.1	0.7		0.0	22.7	5.2
FEB	4.7	0.0	0.4	5.2	13.1	0.9		0.0	24.2	19.5
MAR	15.0	0.0	0.8	8.3	31.8	1.4	0.0	0.0	57.2	42.3
APR	4.4	0.0	1.5	12.1	45.2	2.1	0.0	0.0	65.3	60.9
MAY	68.0	0.0	2.2	13.8	46.2	2.4	0.2	0.1	132.9	64.8
JUN	64.0	0.5	2.6	14.7	41.5	1.9	0.0	0.1	125.3	61.2
JUL	67.9	0.2	2.5	17.7	46.1	1.0	0.1	0.0	135.6	67.7
AUG	87.8	1.8	3.1	13.1	41.0	0.6	0.5	0.0	147.9	60.1
SEP	86.9	0.3	3.0	14.0	39.9	2.5	11.4	0.0	158.0	71.1
OCT	63.9	0.7	2.7	8.0	33.6	2.2	2.7	0.0	113.8	49.8
NOV	3.0	0.3	2.8	3.3	21.0	0.7	1.3	0.0	32.5	29.5
DEC	13.6	0.0	1.5	3.0	10.9	0.4	0.0	0.0	29.4	15.8
TOTAL	496.7	3.8	23.8	114.8	372.4	16.9	16.3	0.2	1044.8	547.9
1998										
JAN	1.0	0.2	1.4	1.4	4.0	0.3	0.9	0.2	9.3	8.2
FEB	0.0	0.0	0.7	0.5	0.7	0.3	0.1	0.0	2.3	2.3
MAR	0.0	0.0	0.5	2.8	10.5	0.4	1.3	0.3	15.9	15.6
APR	0.0	0.1	1.0	2.1	13.1	0.7	2.0	0.0	19.1	19.1
MAY	0.0	0.2	1.5	1.7	17.2	1.1	1.8	0.1	23.6	23.5
JUN	0.0	0.2	2.2	8.6	25.2	2.2	3.4	0.9	42.7	41.8
JUL	46.9	0.8	2.7	13.8	43.0	2.4	4.2	0.2	114.1	67.0
AUG	79.2	0.0	4.3	10.9	42.5	3.1	N/A	0.2	140.2	60.8
SEP	62.9	0.5	3.7	8.9	34.7	1.4	7.5	0.1	119.7	56.7
OCT	35.2	1.6	3.8	9.4	19.3	1.3	1.7	0.1	72.5	37.2
NOV	0.0	0.3	2.5	7.3	17.7	1.7	1.9	0.5	32.0	31.4
DEC	9.3	0.1	1.9	6.0	12.7	0.6	2.0	0.4	32.9	23.3
TOTAL	234.5	4.0	26.3	73.5	240.6	15.6	26.8	2.8	624.1	386.9

TABLE 5.5-3 (CONTINUED)

RECLAIMED WATER USAGE (AF)
COB RECLAMATION PLANT

MONTH	POWER PLANT[1]	CAL TRANS	MEDIA CITY CTR	LAND FILL	DEBELL GOLF	MUIR SCHOOL	McCAM PARK	WATER TRUCKS	MONTHLY TOTALS USED[1]	MONTHLY TOTALS LANDSCAPE[2]
1999										
JAN	4.7	0.2	1.1	4.1	14.1	1.1	1.9	0.0	27.3	22.5
FEB	0.0	0.1	0.7	2.7	5.5	0.3	0.4	0.1	9.8	9.7
MAR	0.0	0.3	0.8	3.8	14.4	1.3	1.2	0.3	22.0	21.7
APR	0.0	0.1	1.0	4.8	12.0	0.7	1.8	0.2	20.5	20.4
MAY	0.0	0.2	1.5	7.8	26.2	1.5	2.8	0.3	40.1	39.8
JUN	0.0	0.1	1.9	10.1	29.2	2.1	2.7	0.0	46.2	46.1
JUL	32.8	0.7	2.4	11.6	41.3	2.4	3.7	0.0	94.8	62.0
AUG	49.6	0.7	3.6	15.1	42.6	2.7	3.0	0.0	117.3	67.8
SEP	22.3	0.6	3.8	14.0	35.0	1.6	2.2	0.0	79.4	57.2
OCT	31.9	1.0	3.6	14.7	33.9	1.6	1.9	1.2	89.7	56.7
NOV	27.1	0.2	3.1	9.8	15.6	1.3	1.1	0.0	58.3	31.2
DEC	16.3	0.4	2.5	5.2	23.1	1.2	1.0	0.1	49.9	33.5
TOTAL	184.6	4.5	26.0	103.8	292.8	17.9	23.6	2.3	655.4	468.6
2000										
JAN	18.8	0.3	2.0	5.1	12.4	1.2	1.3	0.0	41.1	22.4
FEB	7.8	0.0	1.4	3.3	4.8	0.6	0.0	0.0	17.8	10.0
MAR	5.4	0.0	1.3	3.3	12.7	0.4	0.0	0.0	23.1	17.8
APR	5.7	0.2	1.5	10.2	25.5	1.3	1.8	0.0	46.1	40.5
MAY	53.4	0.3	2.1	8.5	31.6	1.7	2.1	0.0	99.8	46.4
JUN	77.0	0.3	2.9	18.0	42.4	2.3	2.9	0.0	145.7	68.7
JUL	73.1	0.8	3.0	17.0	43.6	2.2	2.9	0.0	142.6	69.5
AUG	100.7	0.8	3.6	16.7	47.5	2.2	3.6	0.0	175.1	74.4
SEP	78.3	0.6	3.2	16.3	32.0	1.8	2.6	0.0	134.7	56.4
OCT	45.7	0.2	3.5	11.1	21.1	1.5	1.3	0.0	84.3	38.6
NOV	36.3	0.2	2.7	5.7	17.3	0.6	1.3	0.0	64.1	27.8
DEC	33.9	0.1	2.3	7.1	15.2	0.7	1.3	0.0	60.7	26.8
TOTAL	535.9	3.8	29.5	122.2	305.9	16.6	21.2	0.0	1035.2	499.2

1 Use based on Power Plant make-up only.

2 Landscape does not include Power Plant or Water Trucks.

The existing reclaim water treatment plant is operated to remove conventional pollutants (BOD). Treatment provided at the reclaim water treatment plant consists of primary clarification, aeration, secondary clarification, filtration and disinfection. A description of the existing treatment units at the reclaim water treatment plant is provided as Attachment 1A. Attachment 1B is a process schematic.

Reclaimed water will be used as primary water source to the MPP facility's evaporative cooling tower makeup. The average daily water consumption for cooling water at the MPP is expected to be 1.2 MGD. Well water and domestic water supply on the site will be the backup sources of cooling water for the MPP.

Planned Upgrades to Reclaim Water Treatment Plant. The reclaim water treatment plant is being upgraded to enable the facility to meet new effluent standards and to increase capacity. The new standards include removal of nutrients where discharge limitations are being established through the total maximum daily load (TMDL) assessment of water quality needs. The constituents of immediate concern to the reclaim water treatment plant are nitrogen ammonia, nitrite and nitrate. The upgrade will provide for biological nutrient removal through the addition of aeration basins and secondary clarification improvements, reliability improvements, upgrading of the disinfection system and addition of dechlorination capabilities. The enhanced primary treatment will allow for increased removal of metals and other constituents if it becomes necessary in the future. In addition, the improvements will be designed for an 18.0 (rather than 12.0) mgd peak hydraulic throughput under consideration for future applications.

COB Reclaim Water Demand. Throughout the 1990s the COB has actively sought additional applications for its available reclaimed water. This effort has had mixed results. Prior to 1990 the only reclaimed water users were the COB power plant and Caltrans (for landscape irrigation along I-5). The other uses described above have commenced as a result of the effort to expand reclaimed water usage. COB now supplies an average of 464 AFYto reclaimed water projects, Recent improvements in the Caltrans irrigation system and reduction of operating loads at the COB power plant have reduced reclaimed water use by these long term users. In addition, several large industrial water customers have closed operations and have left the area. The COB has plans to expand its reclaimed water distribution system, and expects to supply an additional 0.07 MGD (75 AFY) to new projects within the next five years.

Backup Cooling Water Supply. The COB has committed to provide backup non-reclaimed water to the MPP from one of several city water sources. The COB obtains its water supply from two sources. Approximately 14,800 AFY of groundwater is pumped from wells owned or operated by the COB and approximately 8200 AFY of water is purchased from the MWD or the SWP. A portion of the groundwater pumped by the COB has been contaminated with TCE, PCE, NO_3^- and Cr^{6+}. This groundwater is treated to remove VOCs and blended with MWD water to lower the NO_3^- concentration to meet drinking water standards. The COB has curtailed use of well water with elevated Cr^{6+} concentrations. Water purchased from MWD is a blend of supplies available through the SWP and the Colorado River Aqueduct.

Because the San Fernando Valley is an adjudicated basin, groundwater pumping by the COB is limited to a volume equal to 20% of water imported by the COB. This limitation assumes 20% return flow to the groundwater basin from infiltration associated with irrigation and other uses. Consequently, groundwater pumping by the COB is limited more by COB water rights than by aquifer characteristics or available supply.[3] The COB currently purchases about 36% of its water supply from MWD. For nearly 10 years, the COB purchased as much as 100% of its water supply from MWD while groundwater contamination was being evaluated and treatment facilities were being constructed. The COB may purchase additional water as needed from the City of Los Angeles or MWD.

The COB has provided a can-and-will-serve letter to provide water for the MPP. Given the variety of water sources available, it is anticipated that domestic water supplied by the COB could be any of three water types. The three types of water available from the COB are; well water, MWD water, or finished (treated and blended) domestic water. The well water to be provided to the MPP will be treated by COB prior to use. Treatment will include filtration through granular activated carbon to remove the VOCs, and SO_2 reduction and sand filtering can be employed to remove Cr^{6+}. When the COB provides MWD or finished domestic water for use as backup cooling water, no pretreatment, other than dechlorination, will be necessary.

The COB owns two wells on the MPP site. The two existing groundwater wells onsite are capable of producing about 2900 AFY. These were taken out of service in the fall of 2000 due to elevated levels of Cr^{6+}. The well water is also contaminated with TCE and PCE. Given that the COB has committed to provide backup cooling water of variable quality, specifically including untreated groundwater, it is anticipated that the COB may, at some point, provide water requiring the pretreatment described above.

The COB may realize some advantages in providing well water to the MPP. The two city wells located in close proximity to the MPP site extract water from an area of high concentration within the TCE and PCE plumes. Pumping water from these wells would not cause the plumes to migrate, but would help contain and reduce the plumes. The EPA has calculated that groundwater extraction at the rate of 9,000 gpm is required to control the plumes. The COB has not been able to maintain extraction of more than 6,000 to 8,000 gpm. Additional groundwater pumping would help the COB meet the objective set by the EPA for control of the plumes. Providing well water to the MPP would help COB meet the objectives set by the EPA for control of plumes.

COB Domestic Water. Domestic water will be used for human consumption and sanitary facilities, use in the Fire Protection System and as a backup to the demineralizer. Domestic water is available onsite through a six-inch water main that crosses the proposed site for the new unit. Total availability to the site has not been determined by the COB Public Works Department, but a hydrant test performed near the intersection of Varney and Magnolia was reported to provide at least 2,500 gpm with a residual pressure of over 100 psi. This

[3] Burbank Water and Power, 2000, Urban Water Management Plan, Water Division, December 2000.

demonstrates sufficient water for MPP for both the boiler feedwater and the cooling water makeup.

Domestic water for the facility will be purchased from the COB. For normal domestic uses at MPP, the water consumption is estimated at 2000 gpd. The existing onsite city water supply pipeline is capable of handling the project's domestic water demand.

Water Supply Requirements. The typical daily and annual water uses for the MPP are shown in Tables 3.4-1 and 3.4-1A. Figure 3.4-5A shows the expected water balance and usage for an annual average day. Figure 3.4-5B shows the water balance and usage for a maximum daily condition. The water supply requirements include domestic uses, fire water, cycle makeup and miscellaneous plant uses, cooling tower makeup, and CTG inlet air evaporative cooler. Cooling tower duty includes auxiliary cooling loads.

TABLE 5.5-4

DAILY WATER SUPPLY REQUIREMENTS

	Average Usage[1]	Maximum Usage[1]
Water Supply – Reclaim Water Only		
Cooling Water Makeup	1,348,000 gal/day[2]	1,854,000 gal/day[2]
Cycle Makeup Treatment System	94,000 gal/day	229,000 gal/day
Plant and Equipment Drains	11,000 gal/day	11,000 gal/day
Evaporative Cooler	35,000 gal/day	89,000 gal/day
Chemical Drains	0 gal/day	0 gal/day
Bypassed to Discharge[3]	3,067,000 gal/day	4,363,000 gal/day
TOTAL[4]	4,555,000 gal/day	6,546,000 gal/day
Domestic Water Potable and Sanitary Uses[5]	2,000 gal/day	2,000 gal/day

1 "Average Usage" is based on a 64° F (average annual) ambient temperature, and "Maximum Usage" is based on 81° F ambient temperature (daily average) at full load with duct firing 12 hrs/day.

2 Does not include wastewater streams recycled to tower as supplemental makeup. Refer to water mass balance (Figures 3.4-5A through D) for amounts of wastewater to be recycled to the cooling tower.

3 The flows shown will vary depending on reclaimed water quality. On days when sufficient reclaim water is not available, other waters are used to supplement the reclaimed water supply.

4 Plant drains are not combined with other reclaim use on the water balances.

5 Potable water is the emergency cooling water supply.

TABLE 5.5-4A

ANNUAL WATER CONSUMPTION

Water Supply	Average Annual Usage[1]
Reclaimed Water fm RWP to MPP[2]	4,668 acre-ft/year
Non-Reclaimed Water fm COB[3]	434 acre-ft/year
Non-Reclaimed Water for Demin. Syst.[4]	105 acre-ft/year
Water from MPP to Discharge 001	3,740 acre-ft/year
Net Water Consumed	1,362 acre-ft/year
Domestic Water	2.2 acre-ft/year
Total Water Use	1,364 acre-ft/year

1 Based on 64º F annual average temperature and full load operation.

2 Based on 732 mg/l TDS.

3 Based on historical reclaimed water availability.

4 Non-reclaimed water for non-cooling use.

Untreated well water and domestic water supplied by the COB will be used only when necessary. Given the physical constraints on the domestic water supply in Southern California and the political nature of the issue, reclaimed water represents the best option for cooling tower makeup. The cooling tower makeup water (1.35 MGD on average) normally can be supplied by the Reclaimed Water Plant. This provides further beneficial use for this wastewater that is otherwise discharged to the ocean.

Water Quality and Balance. The expected average quality of the reclaimed and that of the domestic water are as listed in Table 5.5-5. Water use scenarios are shown in the water balance diagrams (Figures 3.4-5A, B, C and D).

The following parameters were used to generate the water balance figures 3.4-5 A through D from which all tabular data are derived.

1) The HRSG steaming rate is 437,718 pounds per hour.

2) The load factor used is 100 percent.

3) Duct firing is considered 1000 hours per year for the average cases and 12 hours per day for the maximum cases. Corresponding steam injection is based on 123,150 pounds per hour water use. This is a conservative estimate since the MPP has committed to a limit on steam injection of 200 hours per year.

4) HRSG blowdown is set to 1.83 percent of the steaming rate. Derived from experience.

5) All steam injection water, blowdown and non-recoverable losses are equal to the steam cycle makeup.

6) Gas turbine washing and HRSG soot blowing and other non-cycle, demineralized uses are equal to 71,000 gallons per day for the units under consideration. Derived from experience.

7) The dry bulb temperatures considered are 64 and 80^{o} F for the annual average and maximum daily cases, respectively.

8) The relative humidity is 26 percent.

9) Drift from the cooling tower is mandated to be 0.006 percent.

10) Cooling tower recirculation rate is 51,319,888 pounds per hour.

11) Evaporative coolers are used in the cycle. The cycles of concentration used in the evaporative coolers is 1.5 due to the high susceptibility of the small tubes in the cooler to scaling type fouling.

12) Evaporative cooler evaporation is equal to 4,000 pounds per hour.

13) The average cooling tower evaporation is 397,796 pounds per hour.

14) The maximum cooling tower evaporation is 522,350 pounds per hour.

15) Plant service water uses are estimated at 7.6 gpm from experience.

16) An average of 100 gallons per day of precipitation anticipated to be processed through the oil/water separator at MPP.

17) The worst case described, when using non-reclaim water, is a 50/50 blend selected to produce a mid-point between the 100 and 0 percent reclaim water use cases.

18) For the present reclaim water quality the cycles of concentration are based on the silica limit and equal 5.6.

Water Pretreatment. The MPP will have the capability to hypochlorinate reclaimed water prior to direct use as cooling tower makeup. Local groundwater must be treated to remove VOCs; the VOCs will be removed by activated carbon filters. Hexavalent chromium may need to be removed from the local groundwater, so this may be accomplished by reduction with sulfur dioxide to convert hexavalent chromium to trivalent chromium and then settling and filtration to remove the trivalent chromium.

Domestic water will be supplied through an interconnection with the COB's existing distribution system and will not require pretreatment. Demineralization of reclaimed and domestic water will be performed onsite.

<u>Cooling Tower Makeup Water</u>. There will be one cooling tower for the MPP. The tower will provide heat rejection for the facility's steam turbine cycle. The majority of the makeup water will be reclaimed water and is expected to have a total dissolved solids (TDS) content of approximately 732 milligrams per liter as fed to the cooling tower. Untreated well water and domestic water will be available for use in the cooling tower only on an emergency cooling basis, and as necessary to meet discharge limitations. The circulating water will be continuously treated and controlled in order to achieve not more than 5.6 cycles of concentration. A summary of the cooling tower operation is contained in Table 5.5-6.

<u>Circulating Water Treatment</u>. A circulating water chemical feed system will supply water conditioning chemicals to the circulating water system to minimize corrosion and to control biofouling. To prevent ground contamination, all circulating water chemicals will be stored in double contained storage tanks.

Sulfuric acid will be fed into the circulating water system for alkalinity reduction and pH adjustment in order to control the scaling tendency of the circulating water. The acid feed equipment will consist of a bulk sulfuric acid storage tank and two full-capacity, piston-diaphragm sulfuric acid metering pumps.

To minimize biofouling in the circulating water system, sodium hypochlorite will be shock fed into the system as a biocide. The hypochlorite feed equipment will consist of a bulk storage tank and two full-capacity, piston-diaphragm inhibitor metering pumps. Residual chlorine in the blowdown water will be minimized by the design of the chlorination/dechlorination system and its operation. Proprietary biocide will be available onsite for direct feed into the circulating water system to control algae, if necessary. Dechlorination of blowdown will be used prior to return to the Reclamation Plant wastewater pipeline to ensure that the Discharge 001 to the Burbank Western Channel is compliant with discharge limitations.

At 5.6 cycles of concentration, it is estimated that the circulating water returned to the Reclamation Plant discharge pipeline will have a TDS content of approximately 3,800 milligrams per liter (mg/l). The discharge to Outfall No. 001 will meet the current TDS discharge limitation of 950 mg/l. No significant impacts are anticipated from the increased TDS concentration of the discharge as the total loading of TDS will be approximately the same as under current conditions and the total discharge from the Reclamation Plant constitutes only 2-8% of the base flow of the Los Angeles River.

TABLE 5.5-5

EXPECTED RECLAIMED AND DOMESTIC WATER QUALITY (mg/L, EXCEPT AS NOTED)

Constituent	Design Reclaimed Water	Design Well Water	Design Domestic Water
Calcium	57	58	61
Magnesium	18	14	15
Sodium	114	37	44
Potassium	15	3	3
M-Alkalinity, as $CaCO_3$	247	174	184
Chloride	82	29	34
Sulfate	96	56	62
Fluoride	<0.1	0.5	<0.1
Nitrate	25	18	21
Silica	23	5	22
TSS	1	1	0.2
Turbidity	1	NR	0.4 (NTU)
TDS	732	434	479
BOD_5	8	NR	NR[1]
Ammonia	NR[1]	NR	NR[1]
COD	NR[1]	NR	NR[1]
Boron	<1	NR	NR[1]
Phosphate	3	NR	<0.1
pH, S.U.	7.3	7.3	7.6
Cyanide	<0.02	NR	NR[1]
Cadmium	<0.010	<0.010	NR[1]
Chromium	<0.010	<0/010	<0.010
Copper	0.001	0.050	0.007
Lead	<0.050	<0.050	NR[1]
Mercury	<0.001	<0.001	NR[1]
Nickel	<0.001	0.010	NR[1]
Silver	<0.050	0.010	NR[1]
Zinc	0.001	0.050	0.21

[1] NR – Not reported.

TABLE 5.5-6

COOLING TOWER OPERATING CHARACTERISTICS

Parameter	Cooling Tower[1] Average	Evaporative Coolers
Circulating Water, gpm	103,000	1,650
Number of Cells	6	--
Makeup, gpm	968	24
Blowdown, gpm	172	16
Drift, gpm	1	--
Evaporation plus Drift, gpm	797	8

[1] All numbers are approximate and are for 64º F day conditions and full load operation.

Cycle Makeup Water Treatment. Prior to use as makeup to the HRSG/STG steam cycle, additional treatment of either reclaimed or city water by demineralization will be required. The water will be directed to the cycle makeup treatment system to produce high quality demineralized water for makeup to the steam cycle and for miscellaneous plant uses. This system will include a leased mobile demineralizer utilizing offsite regeneration facilities. Demineralized water produced will be directed to a demineralized water storage tank for storage and use.

Cycle Chemical Feed System. The Cycle Chemical Feed System will supply water conditioning chemicals to the HRSG/STG steam cycle to minimize corrosion. The system will feed an oxygen scavenger and a neutralizing amine to the feedwater and condensate, respectively, for dissolved oxygen control and cycle pH control. The design will provide for automatic feed of oxygen scavenger and amine in proportion to feedwater and condensate flow rates, respectively. This method of treatment is referred to as all volatile treatment and is often employed for once-through design steam generators.

5.5.2.1.2 Hydrology and Water Quality

100-Year Flood Plain.

Surface Water. Site drainage within the new power block area will be similar to the existing system. Storm runoff will be collected and routed to the 36-inch storm drain and then to the Burbank Western Channel. Drawing No. 09953-DS-S3002 (Site Grading and Drainage Plan included in attached Data Response 5) shows the proposed drainage system and conceptual grading plan. Storm water flows from areas with potential for oil contamination will be directed to an oil/water separator before being discharged to the sanitary sewer system.

Groundwater. Groundwater at the facility is found at a depth of 100 feet. This groundwater is contaminated by the Lockheed Superfund site and is treated for use at the existing facility.

5.5.2.1.3 <u>Wastewater Treatment and Disposal</u>. The primary component of the wastewater from the MPP will consist of blowdown from the cooling towers. This will be returned to the Reclamation Plant wastewater discharge pipeline. The Reclamation Plant discharge is to the Burbank Western Channel through Discharge 001 as permitted by NPDES Permit CA0055531.

<u>Sanitary Wastewater</u>. The sanitary sewer system will connect the new facilities to the existing sanitary sewer that currently runs north/south through the site. The sewage will be treated in an existing reclaim treatment plant.

<u>Process Wastewater</u>. The combined process wastewater discharge from the plant will consist of cooling tower blowdown. (Refer to Tables 5.5-6 and 5.5-8); Figures 3.4-5A and 3.4-5B also illustrate the sanitary and oily wastewater flow paths. Relatively higher quality wastewater such as HRSG blowdown, plant drains without oil contamination, and CTG inlet air evaporative cooler blowdown will be recycled and reused as supplemental makeup to the cooling tower.

The discharge of process wastewater from the power plant site will be returned to the Reclamation Plant discharge line. The Reclamation Plant discharge is to the Burbank Western Channel, which eventually flows into the Los Angeles River. The LARWQCB, by October 98-052, issued NPDES Permit CA0055531 to cover both the PWD Water Reclamation Plant and the steam power plant. The existing permit has designated Discharge 001 for the outfall at the power plant facility and Discharge 002 for the excess reclaimed water discharged at the Reclamation Plant. The LARWQCB regulates the discharge by determining the maximum allowable levels of various constituents and the fees associated with discharge for both flow and the constituents discharged.

The COB Municipal Code also contains restrictions on the constituents that can be discharged to the reclaim water plant, storm drain system, or waters of the state.

One further set of revised discharge limits, LARWQCB Order 98-072, is in effect until October 1, 2002, that if complied with, will allow delay of compliance with the discharge limits in Order 98-052 until October 3, 2006.

Concentration limits are placed on the water quality of the effluent. A series of standards that have been developed and that govern the maximum allowable limits for many constituents are shown below in Table 5.5-5. All information related to these levels has been taken from the RWQCB Orders 98-052 and 98-072.

The temperature of the discharge shall not exceed 100 F. Cooling tower blowdown will come from the cooling tower basin that will operate at a maximum temperature of 84° F.

This discharge will an insignificant effect on the temperature of fluid at Outfall 001, because it will normally be mixed with at least 3 parts or more of water coming directly from the COB Reclamation Plant that has an average discharge temperature of 79° F. Other constituent levels must also be monitored and maintained, depending on the location within the watershed and point of discharge to the Los Angeles River. Each river may have different effluent limits because of upstream and downstream conditions.

The fees associated with this type of discharge are also regulated by the RWQCB. However, this is dependent on the categorization of the effluent upon submittal of a permit application. Based on discussion with the RWQCB, the effluent will most likely be categorized as a Type 1-A or 1-B discharge. The associated annual fees are shown in Table 5.5-7.

TABLE 5.5-7

RWQCB ANNUAL FEE SCHEDULE

Categorical Rating	Fee
1-A	$10,000
1-B	$ 7,000

Alternative Wastewater Discharge Methods. The primary component of the wastewater will consist of blowdown from the cooling towers. Other wastewaters will also be discharged from the site. The selected option for industrial wastewater discharge is to the Burbank Western Channel Discharge 001, which is permitted by NPDES Permit CA0055531. Sanitary wastes must be sent to the sanitary waste line already onsite. Additional analysis is included in Appendix R attached in Data Adequacy Responses submitted September 2001.

TABLE 5.5-8

ESTIMATED LIQUID PROCESS WASTE VOLUMES TO DISCHARGE 001 AND TO LOCAL SEWER

Waste Stream	Source	Typical Wash Volume[1]	Peak Flows	Sewer Volume
Cooling Tower Blowdown	Cooling tower reclaim water makeup, evaporative cooler blowdown, SCR regeneration water, boiler blowdown.	247,000 gal/day	239 gpm	
Uncontaminated Precipitation Runoff[3]	Weather	25,000 gal/day	150 gpm	
Reclaim Discharge Line	Reclaim Plant	3,067,000 gal/day	3,030 gpm	
Total to Discharge 001		3,339,000 gal/day	3,286 gpm	
Oil/Water Separator Effluent	Plant and equipment drains contaminated precipitation runoff		100 gpm[2]	11,000 gal/day
Sanitary Drains	Domestic wastes		50 gpm	2,000 gal/day
Total to Local Sewer			150 gpm	13,000 gal/day

1 All numbers are approximate and are based on 64° F annual average ambient temperature and full load operation.

2 Excluding precipitation runoff.

3 Only precipitation runoff from areas with potential oil contamination go to the oil/water separator.

5.5.2.2 Transmission Line Route

The electrical interconnection for the project will not require the acquisition of rights-of-way outside the MPP area. Therefore, there will be no water resources impacts related to the construction or operation of transmission lines for the project.

5.5.2.3 Pipelines

No offsite pipelines will be constructed to support the MPP.

5.5.2.3.1 Fuel Gas Supply Line. Natural gas will be delivered to the plant site by SoCalGas using the existing lines onsite or adjacent to the site. Therefore, there will be no water resources impacts related to the construction or operation of a fuel gas supply line for the project.

5.5.2.3.2 Wastewater Discharge Lines

Sanitary Wastewater. Construction of the proposed sewer line will be in accordance with the COB requirements. The capacity of the pipeline will be large enough to allow additional connections for potential future dischargers. The MPP will discharge approximately 2,000 gpd (2.2 acre-feet per year) to the sanitary sewer.

Process Wastewater. The final combined process wastewater discharge from the plant will include the following streams: cooling tower blowdown, combustion turbine evaporative cooler blowdown, and steam cycle drains. The combined wastewater is estimated to average 247,000 gpd (277 acre-feet per year) and will be returned to the Reclamation Plant discharge line. The Reclamation Plant discharge is to NPDES Discharge 001 to the Burbank Western Channel located along the eastern property line.

5.5.2.4 Water Supply Line

Anticipated reclaimed water demand can be supplied via the existing onsite 24-inch diameter water main. Untreated groundwater will be provided by existing on-site wells. Anticipated domestic water demand can be supplied via the existing water system on the MPP site. A will-serve letter has been provided by the COB to provide well water and domestic water. Therefore, there will be no water resources impacts related to the construction or operation of water supply lines for the project.

5.5.2.5 Access Road

The new facilities will be served by the existing road network. The existing asphalt paved entrance road off of Magnolia Boulevard will be used for access to the new power block and administration building expansion areas. All additional parking areas and miscellaneous access drives will also be asphalt paved.

5.5.3 Mitigation Measures

This section presents Applicant-committed mitigation measures that will be implemented to reduce impacts to water supply, hydrology and water quality in areas affected by the MPP, including the plant site, transmission line, pipelines and access road.

WTR-1: Implement design measures to minimize erosion at the site.

WTR-2: Perform construction activities at the plant site and construction-staging site in accordance with the Construction SWPPP and associated Monitoring Plan, which will be required for the project in accordance with the California NPDES General Permit for Storm Water Discharge Associated with Construction Activity. The SWPPP will include BMPs to control erosion and sediment (as well as other pollutants) during construction.

WTR-3: Conduct operations at the plant site in accordance with the facility SWPPP and associated Monitoring Plan, which will be required for the project in accordance with the California NPDES General Permit for Storm Water Discharges Associated with Industrial Activities. Implement the BMPs listed in the SWPPP to prevent or control pollutants potentially associated with the operation of the plant.

WTR-4: Perform refueling and maintenance of construction equipment only in designated lined and/or bermed areas. Prepare and implement spill contingency plans in areas where they are appropriate.

WTR-5: Maximize volumes of reclaimed water used onsite and reduce domestic water use to the extent practicable.

WTR-6: Install storm drain inlet filters to treat the volume of runoff from the MPP site produced from a 0.75-inch storm event, prior to release to the Reclamation Plant wastewater line to Outfall No. 001.

5.5.4 LORS Compliance

Construction and operation of the MPP plant will be conducted in accordance with all applicable LORS and permit conditions pertinent to hydrology and water quality. The applicable LORS for water resources are discussed below and presented in Table 5.5-9.

The MPP will be in compliance with LORS related to surface and ground water resources during construction and operation, principally through the RWQCB permitting process. The LORS so covered include:

- NPDES Permit under the federal Clean Water Act (CWA);
- Spill Prevention Control and Countermeasures (SPCC) Plan and release reporting requirements;
- State Water Use Regulations (General and specific to Power Plant Cooling); and
- California Water Code § 13550 (California Water Codes, Water Code, 2000) requiring use of reclaimed water, where available.

Compliance with the LORS related to operation of the cooling water system and other discharges from the site will be accomplished by applying for, obtaining coverage under, and complying with additional NPDES permits from the RWQCB. The MPP will also prepare new SWPPP and SPCC plans.

TABLE 5.5-9

LORS APPLICABLE TO WATER RESOURCES

LORS	Applicability	Conformance (section)
Federal		
40 CFR Part 423 Effluent Guidelines and Standards for Steam Electric Generating Point Source Category	Prescribe effluent limitation guidelines for cooling tower blowdown and various in-plant waste streams	Existing NPDES Permit (included as Appendix I)
Clean Water Act § 402, 40 CFR Part 122.26	Requires NPDES permits for storm water discharges from MS4s to waters of the United States. Established requirements for storm water discharges under the NPDES program.	Existing LA County MS4 Permit
Clean Water Act § 402, 33 USC § 1342; 40 CFR Parts 122-136.	NPDES permit for construction activities and preparation of a SWPPP and Monitoring Program. Coverage under NPDES General Construction Activity Stormwater Permit needed.	Section 5.5
Clean Water Act § 311; 33 USC § 1321; 40 CFR Parts 110, 112, 116, 117.	Reporting of any prohibited discharge of oil or hazardous substance.	Section 5.5.
State		
California Constitution, Article 10 § 2	Avoid the waste or unreasonable uses of water. Regulates methods of use and methods of diversion of water.	Section 5.5.
California Toxics Rule	Establishes water quality standards for toxics for inland surface waters and enclosed bays and estuaries.	Existing NPDES Permit
State Water Resources Control Board, Resolution 75-58 (June 18, 1975)	Comply with policy on the use and disposal of inland water used for power plant cooling.	Section 5.5.
California Water Code §§ 13271 – 13272; 23 CCR §§ 2250 – 2260.	Reporting of releases of reportable quantities of hazardous substances or sewage and releases of specified quantities of oil or petroleum products.	Section 5.5.
California Water Code § 13263(a)	Requires that waste discharge requirements issued by Regional Boards shall implement any relevant water quality control plans that have been adopted; shall take into consideration the beneficial uses to be protected and the water quality objectives reasonably required for that purpose; shall take into consideration other waste discharges; and the need to prevent nuisance.	Section 5.5
Water Quality Control Plan (Basin Plan) for the Los Angeles Region	Specifies the beneficial uses of receiving waters and contains both narrative and numerical water quality objectives for the receiving waters in the County of Los Angeles.	Section 5.5

TABLE 5.5-9 (CONTINUED)

LORS APPLICABLE TO WATER RESOURCES

LORS	Applicability	Conformance (section)
California Public Resources Code § 25523(a); 20 CCR §§ 1752, 1752.5, 2300 – 2309, and Chapter 2 Subchapter 5, Article 1, Appendix B, Part (1).	Requires information concerning proposed water resources and water quality protection.	Section 5.5.
Local		
Article 10 of Chapter 25, Burbank Municipal Code	Adopts the "Standard Urban Storm Water Mitigation Plan" (SUSMP) issued by the Los Angeles Regional Water Quality Control Board.	Section 5.5

The CEC review of this AFC covers the other applicable LORS, including:

- Information concerning water resources protection in Appendix B under 20 California Code of Regulations (CCR); and
- CEQA Guidelines 14 CCR Section 15000, Appendix G.

5.5.4.1 Federal Authorities and Administering Agencies

Clean Water Act of 1977 (including 1987) amendments § 402; 33 USC § 1342; 40 CFR Parts 122 – 136. The Clean Water Act requires a National Pollutant Discharge Elimination System (NPDES) permit for any discharge of pollutants from a point source to waters of the United States. This law and its regulations apply to storm water and other discharges into waters of the United States. The Clean Water Act requires coverage under the State General Permit for storm water discharges associated with construction activities disturbing five acres or more. The administering agencies for the above authority are the State Water Resources Control Board and the Los Angeles Regional Water Quality Control Board with oversight provided by the United States Environmental Protection Agency (USEPA).

The MPP will file a Notice of Intent (NOI) to comply with the State of California NPDES General Permit for Storm Water Discharges Associated with Construction Activities with the State Water Resources Control Board. In addition, the MPP has prepared a Storm Water Pollution Prevention Plan (SWPPP) and associated Monitoring Plan for implementation during construction. The SWPPP includes control measures including Best Management Practices (BMPs) to reduce erosion and sedimentation as well as other pollutants associated with vehicle maintenance, material storage and handling, and other activities occurring at the project site. The NOI will be filed and the SWPPP and Monitoring Plan prepared prior to the initiation of the construction activities.

The COB discharges excess reclaimed water to the Burbank Western Channel through outfall Nos. 001 and 002. The MPP will divert a portion of the reclaimed water from the COB water reclamation plant for cooling and process water and returns cooling tower blowdown to the Reclamation Plant discharge line to outfall No. 001. The COB currently holds an NPDES Permit for discharges through outfall No. 001 and has provided authorization for this use of the reclaimed water to the MPP. The MPP has notified the Regional Board of the proposed discharge, and staff has indicated that only administrative changes to the NPDES permit will be required to reflect this beneficial use of the Reclamation Plant waste stream.

Clean Water Act § 311; 33 USC § 1342; 40 CFR Parts 122-136. This portion of the Clean Water Act requires reporting of any prohibited discharge of oil or hazardous substance. The MPP will conform by preparing and updating a construction SWPPP, Business Plan and SPCC Plan as appropriate for the proper management of oils and hazardous substances both during construction and operation. The administering agencies for the above authority are the Los Angeles Regional Water Quality Control Board and the California Department of Toxic Substances Control with oversight by USEPA.

National Flood Insurance 42 USC § 1401 et seq., 44 CFR part 70. These sections of the National Flood Insurance statute provides for mapping areas subject to flooding and revisions to those maps. The MPP is located in Zone C, and area determined to be outside of the 500-year floodplain. Because the site is outside of the 500-year floodplain, the hazard for flooding is negligible. The administering agency is the Federal Emergency Management Agency (FEMA).

5.5.4.2 State Authorities and Administering Agencies

California Constitution, Article X § 2. This article prohibits the waste or unreasonable use of water and regulates the method of use and diversion of water. The MPP will comply with this article by diverting and using wastes currently discharged to the Burbank Western Channel. The administering agencies for the above authority are the State Water Resources Control Board and the Los Angeles Regional Water Quality Control Board.

California Porter-Cologne Water Quality Control Act of 1972; California Water Code § 13000 – 14957; 23 CCR. This Act establishes the State Board and the Regional Water Quality Control Boards as the principal state agencies with primary responsibility for the coordination and control of water quality. Discharges of waste must comply with the ground water protection and monitoring requirements of the Resource Conservation and Recovery Act of 1976, as amended (RCRA) (42 USC *Sec.* 6901 *et. seq.),* together with any more stringent requirements necessary to implement this revision or Article 9.5 (commencing with § 25208) of Chapter 6.5 of Division 20 of the Health and Safety Code. The administering agencies for the above authority are the State Water Resources Control Board and the Los Angeles Regional Water Quality Control Board.

California Water Code § 13269; 23 CCR Chapter 9. This code requires the filing of a report of waste discharge and provides for the issuance of waste discharge requirements (WDRs) with respect to the discharge of any waste that can affect the quality of waters of the state. The WDRs may incorporate requirements may incorporate requirements based on the Clean Water Act § 402(p) and implementing regulations at 40 CFR Parts 12 *et. seq.*, as administered by the Los Angeles Regional Water Quality Control Board.

California Water Code § 13550 (California Water Code, 2000). This code section requires the use of reclaimed water, where available. The use of potable domestic water for non-potable uses, including industrial uses, is a waste or an unreasonable use of water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available and:

- Is of adequate quality;
- Is of reasonable cost;
- Its use will not be detrimental to public health; and/or
- Will not degrade receiving water quality or be injurious to plant life, fish and wildlife.

The MPP will comply with this requirement by using reclaimed water to the full availability of this source from the COB Reclamation Plant. It has been determined that other reclaimed sources from the Glendale and City of Los Angeles Tillman treatment plants are not available at a reasonable cost. The administering agencies for the above authority are the State Water Resources Control Board and the Los Angeles Regional Water Quality Control Board.

State Water Policy and Regulation

Los Angeles Region Basin Plan. The Los Angeles RWQCB has jurisdiction over water quality within the region of the proposed project. The RWQCB developed the *Water Quality Control Plan (Basin Plan) for the Los Angeles Region* (RWQCB, 1994*)*, which guides conservation and enhancement of water resources and establishes beneficial uses for inland surface waters, tidal prisms, harbors, and groundwater basins within the region. The Basin Plan was updated by the RWQCB in 1995. Beneficial uses are designated so that water quality objectives can be established, and programs that enhance or maintain water quality can be implemented. In addition, the Basin Plan incorporates by reference all applicable State and RWQCB water quality control plans and policies and other pertinent water quality policies and regulations.

State Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling

State Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling. In 1975 the California Water Resources Control Board (CWRCB) issued The Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling[4]. This Policy provides guidance in the planning and permitting of new power plants using inland waters for cooling and suggests methods for keeping the consumptive use of freshwater to a minimum. The Policy contains the following principles that are applicable to this Project:

- An order of priority of water resources for power plant cooling was established subject to site-specific parameters such as environment, technical, economic and feasibility considerations. The order is:

  1. Wastewater being discharged to the ocean;
  2. Ocean;
  3. Brackish water from natural sources or irrigation return flows;
  4. Inland waste waters of low TDS; and
  5. Other inland waters.

- The use of inland waters for power plant cooling requires analysis of the impact on Delta outflow and Delta water quality objectives.

- The discharge of blow down water from cooling towers must not cause a violation of water quality objectives or waste discharge requirements established by Regional Boards.

The MPP proposes to use wastewater that is being discharged to the ocean via the Los Angeles River for cooling. In addition, this beneficial use of this discharge will not cause a violation of the water quality objectives or waste discharge requirements established by the RWQCB. It is also important to note that the MPP is maximizing the use of reclaimed water for all power plant cooling needs unless the reclaimed water is unavailable due to upsets at the Reclamation Plant. Policy 75-58 is inapplicable to the MPP's proposed use of non-reclaimed water for demineralized water make-up because the demineralized water will not be used for cooling.

Senate Bill 1196 Allowances

SB 1196 §2(e)(3) states "Any [discharge limitation] requirement imposed pursuant to §13262 or 13377 shall be adjusted to reflect a credit for waste present in the reclaimed water before

[4] California State Water Resources Control Board Resolution No. 75-58; Water Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling, June 19, 1975.

reuse. The credit shall be limited to the difference between that amount of waste present in the non-reclaimed water supply otherwise available to the industry and the amount of waste present in the reclaimed water."

Under SB 1196, the COB Public Service Department (PSD) can discharge higher concentrations of chloride, sulfate and TDS than would otherwise be allowed under NPDES because significant amounts of these contaminants are already present in the reclaimed water received from the PWD.

In 1994, Burbank Water and Power (BWP) evaluated the difference between the quality of the reclaimed water received by BWP from the PWD and the quality of the domestic water used by the PSD for the 1994 calendar year. In August 1994 BWP formally notified the RWQCB of its intent to apply SB 1196 credits to discharge 001. BWP calculated NPDES permit limit credits available through SB 1196, which demonstrated compliance at discharge 001. Since then, BWP has focused periodic testing and record keeping on the three constituents in its effluent: chloride, sulfate, and TDS, which are used as indicators of effluent water quality. The effluent monitoring program will continue as before after the MPP facilities are brought into service.

Area-wide Municipal Storm Water NPDES Permit

In accordance with the federal Clean Water Act (CWA), an NPDES permit is required for certain municipal separate storm sewer discharges to surface waters. The MPP is within the area covered by NPDES Permit No. CAS614001 issued by the LARWQCB on July 15, 1996. The permit is a joint permit, with the County of Los Angeles as the "Principal Permittee" and 85 incorporated cities within the County of Los Angeles, including the COB, as "Permittees." The objective of the permit and the associated storm water management program is to effectively prohibit non-storm water discharges, and to reduce pollutants in urban storm water discharges to the "maximum extent practicable," in order to attain water quality objectives and to protect the beneficial uses of receiving waters. This area-wide municipal storm water permit expires July 30, 2001, and a renewal process was initiated in February 2001.

As part of the municipal storm water program, the LARWQCB adopted the Standard Urban Storm Water Mitigation Plan (SUSMP) to address storm water pollution from new development and redevelopment projects. The SUSMP is a model guidance document for use by Permittees in the review and approval of project plans to ensure that project proponents have adequately incorporated post-construction BMPs to manage the quality of storm water and urban runoff. Generally, three types of BMPs are described in the SUSMP, including source control, structural, and treatment control.[5] The SUSMP also specifies numeric standards for the design of structural and treatment control BMPs for infiltration and/or treatment of storm water runoff. Although it has been determined that it does not apply to this facility, the MPP will comply with the requirements of the SUSMP. The MPP will install storm drain inserts at each storm drain inlet on the MPP site to treat storm water runoff to the requirements of the SUSMP requirements. Final design specifications will be provided as part of post-certification compliance.

5.5.4.3 Local Authorities and Administering Angencies

COB Municipal Code; Chapter 25; Article 10; Part 1. Establishes a storm water and runoff pollution control program in compliance with the "Standard Urban Storm Water Mitigation Plan for Los Angeles" (SUSMP).

The administering agency for the above authority is the COB.

Specific information on this requirement is discussed in detail in the Water Section above titled, Area-wide Municipal Storm Water NPDES Permit.

RWQCB, Los Angeles Region; "Standard Urban Storm Water Mitigation Plan for Los Angeles County and Cities in Los Angeles".

The administering agency for the above authority is the COB.

Specific information on this requirement is discussed in detail in the Water Section above titled, Area-wide Municipal Storm Water NPDES Permit.

COB Municipal Code; Chapter 7; Article 19; Part 2. Requires a local stormwater pollution prevention plan (SWPPP) and wet weather erosion control plan (WWECP) be submitted.
The administering agency for the above authority is the COB.

The Applicant has prepared a construction SWPPP and will prepare a WWECP to be reviewed by the COB. The WWECP will be reviewed and approved by the COB Public Works Department prior to permit issuance. The approved WWECP will be submitted to the CEC one week prior to final CEC assessment.

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[5] As defined in the SUSMP: "Source control BMP" means any schedules of activities, prohibition of practices, maintenance procedures, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution. "Structural BMP" means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g., canopy, structural enclosure). The category may include both source control and treatment BMPs. "Treatment control BMP" means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological or chemical process.

5.5.5 References

California Regional Water Quality Control Board, Los Angeles Region 4, Water Quality Control Plan, Los Angeles Region – Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties. June 13, 1994.

California State Water Resources Control Board Resolution No. 75-58: Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling. June 19, 1975.

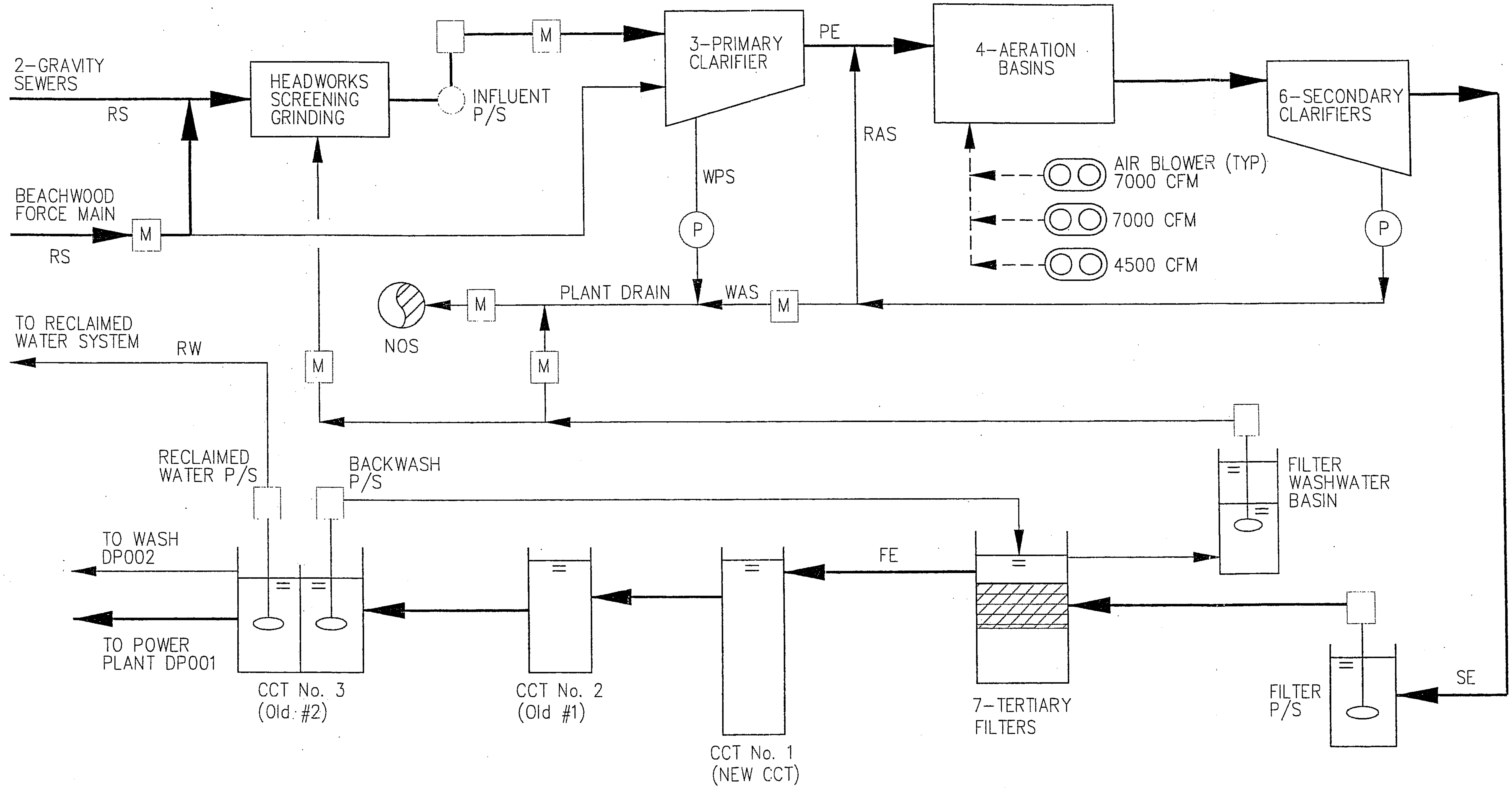
ATTACHMENT 1A

DESCRIPTION OF TREATMENT UNITS

Table 2.1-2: Description of Treatment Units - Continued

No.	Description or Comment
8	Return Activated Sludge (RAS) Pump Station: Telescoping valves from the secondary clarifier discharge to the RAS wet well through an open channel. Three 3 mgd RAS pumps are non clog horizontal centrifugals. All of the RAS pumps are variable speed. Sludge is wasted by means of a modulating valve on the pump discharge line to the NOS. The RAS pumps are old, but are operating well and have recently been equipped with new drive motors.
9	Filter Pump Station: Clarifier effluent flows by gravity into a wetwell with 3-7,000 gpm vertical turbine propeller pumps. The pump discharge is manifolded to a header where a 670 gpm horizontal end suction centrifugal (flash mix) pump is used to inject various chemicals into the discharge header to the Tertiary Filters. The flash mix not used unless there are operational upsets.
10	Tertiary Filters: Seven deep (72-inch) sand filters with each unit having a surface area of 435 sq ft (10 ft x 43.5 ft). Backwash consists of air/water scour where a Waste Washwater Holding Basin of 121,000 active hater holding capacity equalizes flow prior to being pumped by three vertical turbine centrifugals to either the plant influent sewer or the NOS. These new units have a larger sand size then the Eimco dual media filters that were previously used. Turbidity may be an issue when the secondary effluent is of poor quality.
11	Disinfection: Chlorine contact is achieved though the use of three tanks, operated in series. Filtered effluent first flows to a new CCT which contains 379,900 gallons. Flow then passes through CCT 1 which is 682,400 gal in size. Finally, chlorinated effluent passes through CCT 2 which contains 187,600 gallons. CCT 2 also supports two Filter backwash pumps. Three reclaimed water pumps are located adjacent to CCT 2 in a reclaimed water wet well. The total CCT volume is 1,249,000 gallons. Chlorine injectors are located in both the new CCT and CCT 2. Chlorine equipment consists of two 6000 lb/d chlorinators and two 10,000 lb/d evaporators for the CCT feed. Additional equipment includes a 1,500 lb/d chlorinator at the Filter influent feed and a 500 lb/d chlorinator at the RAS feed. Chlorine storage is available for eight cylinders. Two 2-ton scales are available with automatic switchover capability and four storage trunnions.
12	Chemical Storage & Feed Areas: A metal roof covers four polymer mix-feed units with two alum feed units along with a storage area for emulsified polymer. Outside storage tanks consist of a 10,000 gal polymer storage tank and a 5,000 gal alum storage tank. Shop area. RAS VFD's. Flight controls
13	Buildings for Support Facilities: Administration Building: 9,389 sq ft rehabilitated structure that houses the laboratory, control room, plant operations and industrial pretreatment staff. Backwash Blower Building: A 22 x 25 ft concrete block building used to house two blowers used for filter backwash. Storage Building: An 88 x 50.5 ft metal building used for equipment cleanup and storage.
14	Solids Handling: No Solids Handling is done onsite. All solids are discharged to the North Outfall Sewer.
15	Offsite Facilities: Dechlorination using sodium bisulfite is accomplished through pumping with a Hydraulic diaphram pump from a 2,100 gal storage tank. These facilites are located at the Power Plant.Two water tanks are used to store reclaimed water effluent prior to reuse.

ATTACHMENT 1B
PROCESS SCHEMATIC



LEGEND

CHLORINE CONTACT TANKS (CCT)

Kennedy/Jenks Consultants

CITY OF BURBANK
BURBANK WATER RECLAMATION PLANT
PREDESIGN REPORT

SIMPLIFIED PROCESS SCHEMATIC

K/J 004668.00/2.1-1

FIGURE 2.1-1